

BEFORE THE  
PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA  
DOCKET NO. 2004-357-W/S

EXHIBIT  
(Consisting of 12 Schedules)

TO ACCOMPANY THE  
PREPARED DIRECT TESTIMONY

OF

PAULINE M. AHERN, CRRA  
VICE PRESIDENT  
AUS CONSULTANTS - UTILITY SERVICES

ON BEHALF OF  
CAROLINA WATER SERVICE, INC.

CONCERNING  
FAIR RATE OF RETURN

APRIL 2005

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Carolina Water Service, Inc.  
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to the Financial Supporting Exhibits  
of Pauline M. Ahern

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Carolina Water Service, Inc.  
Summary of Cost of Capital and Fair Rate of Return  
Based on the Actual Consolidated Capital Structure of Utilities, Inc. at December 31, 2003

<u>Type of Capital</u>	<u>Ratios (1)</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>	
Total Debt	59.23 %	7.28% (1)	4.31%	4.31%
Common Equity	<u>40.77</u>	11.40% - 11.50% (2)	<u>4.65%</u>	<u>4.69%</u>
Total	<u>100.00 %</u>		<u>8.96%</u> -	<u>9.00%</u>

(1) From Exhibit B, Page 5 of the Application of Carolina Water Service, Inc. for adjustment of rates and charges for the provision of water and sewer service and modification of rate schedules.

(2) Based upon informed judgment from the entire study, the principal results of which are summarized on page 2 of this Schedule.

Carolina Water Service, Inc.  
Brief Summary of Common Equity Cost Rate

No.	Principal Methods	Proxy Group of Six AUS Utility Reports Water Companies	Proxy Group of Three Value Line (Standard Edition) Water Companies
1.	Discounted Cash Flow Model (DCF) (1)	10.6 %	10.8 %
2.	Risk Premium Model (RPM) (2)	10.6	10.8
3.	Capital Asset Pricing Model (CAPM) (3)	10.2	10.4
4.	Comparable Earnings Model (CEM) (4)	14.5	14.4
5.	Indicated Range of Common Equity Cost Rate before Adjustment for Investment Risk	10.90 %	--
6.	Investment Risk Adjustment (5)	<u>0.50</u>	<u>0.50</u>
7.	Recommended Range of Common Equity Cost Rate after Adjustment for Investment Risk	<u>11.40 %</u>	--
			<u>11.50 %</u>

- Notes: (1) From Schedule PMA-6  
(2) From page 1 of Schedule PMA-10.  
(3) From page 1 Schedule PMA-11.  
(4) From page 2 and 4 of Schedule PMA-12.  
(5) Investment risk adjustment to reflect Carolina Water Service, Inc.'s greater investment risk due to its small size vis-à-vis each proxy group as detailed in Ms. Ahern's direct testimony.

Carolina Water Service, Inc.  
Derivation of Investment Risk Adjustment Based upon  
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

		1		2		3	4		5	
Line No.		Total Capitalization (incl. Short-Term Debt) for the Year 2003		Market Capitalization on March 28, 2004 (1)		Applicable Decile of the NYSE/AMEX/NASDAQ	Applicable Size Premium		Spread from Applicable Size Premium (2)	
		(millions)	(times larger)	(millions)	(times larger)					
1.	<u>Carolina Water Service, Inc.</u>	\$ 34.118	(3)							
A.	<u>Based upon the Proxy Group of Six AUS Utility Reports Water Companies</u>			\$ 30.825		10 (4)	6.41%	(5)		
B.	<u>Based upon the Proxy Group of Three Value Line (Standard Edition) Water Companies</u>			\$ 31.580		10 (4)	6.41%	(5)		
2.	<u>Proxy Group of Six AUS Utility Reports Water Companies</u>	\$ 502.690	(6)	14.7 x	\$ 623.771	20.2 x	8 (7)	2.36%	(8)	4.05%
3.	<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>	\$ 865.130	(9)	25.4	\$ 1,101.438	34.9	6 - 7 (10)	1.68%	(11)	4.73%

Decile	Number of Companies	Recent Total Market Capitalization (millions)	Recent Average Market Capitalization (millions)
1 - Largest	172	\$8,214,688.366	\$47,759.816
2	177	1,722,153.325	9,729.680
3	199	894,917.914	4,497.075
4	209	548,389.454	2,623.873
5	219	400,381.543	1,828.226
6	257	325,662.936	1,267.171
7	300	264,131.617	880.439
8	372	219,976.996	591.336
9	589	230,476.080	391.301
10 - Smallest	1782	185,820.318	104.276

See page 4 for notes.

Carolina Water Service, Inc.  
Derivation of Investment Risk Adjustment Based upon  
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE

Notes:

- (1) From page 5 of this Schedule.
- (2) Line No. 1 – Line No. 2 and Line No. 1 – Line No. 3 of Columns 3 and 4, respectively. For example, the 4.05% in Column 5, Line No. 2 is derived as follows  $4.05\% = 6.41\% - 2.36\%$ .
- (3) Total Assets and Liabilities from Application of Carolina Water Service, Inc. for adjustment of rates and charges for the provision of water and sewer service and modification of rate schedules, Schedule A.
- (4) With an estimated market capitalization of \$30.825 million (based upon the proxy group of six AUS Utility Reports water companies) and \$31.580 (based upon the proxy group of three Value Line (Standard Edition) water companies), Carolina Water Service, Inc. falls in the 10<sup>th</sup> decile of the NYSE/AMEX/NASDAQ which has an average market capitalization of \$104.276 as can be gleaned from the information shown in the table on the bottom half of page 3 of this Schedule.
- (5) Size premium applicable to the 10<sup>th</sup> decile of the NYSE/AMEX/NASDAQ as shown on page 15 of this Schedule.
- (6) From page 1 of Schedule PMA-3.
- (7) With an estimated market capitalization of \$623.771 million, the proxy group of six AUS Utility Reports water companies falls in the 8<sup>th</sup> decile of the NYSE/AMEX/NASDAQ which has an average market capitalization of \$591.336 million as can be gleaned from the information shown in the table on the bottom half of page 3 of this Schedule.
- (8) Size premium applicable to the 8<sup>th</sup> deciles of the NYSE/AMEX/NASDAQ as shown on page 15 of this Schedule.
- (9) From page 1 of Schedule PMA-4.
- (10) With an estimated market capitalization of \$1,101.438 million, the proxy group of three Value Line (Standard Edition) water companies falls between the 6<sup>th</sup> and 7<sup>th</sup> deciles of the NYSE/AMEX/NASDAQ which has an average market capitalization of \$1,073.805 million as can be gleaned from the information shown in the table on the bottom half of page 3 of this Schedule.
- (11) Average size premium applicable to the 6<sup>th</sup> and 7<sup>th</sup> deciles of the NYSE/AMEX/NASDAQ as shown on page 15 of this Schedule.

Carolina Water Service, Inc.  
Market Capitalization of Carolina Water Service, Inc.  
the Proxy Group of Six AUS Utility Reports Water Companies and the  
the Proxy Group of Three Value Line (Standard Edition) Water Companies and the

Company	1 Common Stock Shares Outstanding at September 30, 2004 ( millions )	2 Book Value per Share at September 30, 2004 (1)	3 Total Common Equity at September 30, 2004 ( millions )	4 Closing Stock Market Price on March 28, 2005	5 Market-to-Book Ratio at March 28, 2005 (2)	6 Market Capitalization on March 28, 2005 (3) ( millions )
Carolina Water Service, Inc.	NA (4)	NA	\$ 13.241 (4)	NA		
Based upon the Proxy Group of Six AUS Utility Reports Water Companies					232.8 % (5)	\$ 30.825 (6)
Based upon the Proxy Group of Three Value Line (Standard Edition) Water Companies					238.5 % (7)	\$ 31.580 (8)
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>						
American States Water Co.	16.689	\$ 15.238	\$ 254.303	\$ 25.500	167.3 %	\$ 425.570
Aqua America, Inc.	93.243	7.294	680.119	24.200	331.8	2,256.481
Artesian Resources Corp.	3.946	13.747	54.245	26.050	189.5	102.793
California Water Service Group	18.345	15.678	287.605	33.920	216.4	622.262
Middlesex Water Company	11.327	8.345	94.529	18.030	216.1	204.226
York Water Company	6.874	6.925	47.601	19.100	275.8	131.293
Average	25.071	\$ 11.205	\$ 236.400	\$ 24.467	232.8 %	\$ 623.771
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>						
American States Water Co.	\$ 16.689	\$ 15.238	\$ 254.303	\$ 25.500	167.3 %	\$ 425.570
Aqua America, Inc.	93.243	7.294	680.119	24.200	331.8	2,256.481
California Water Service Group	18.345	15.678	287.605	33.920	216.4	622.262
	\$ 42.759	\$ 12.737	\$ 407.342	\$ 27.873	238.5 %	\$ 1,101.438

NA = Not Available

- Notes:
- (1) Column 3 / Column 1.
  - (2) Column 4 / Column 2.
  - (3) Column 5 \* Column 3.
  - (4) At June 30, 2004
  - (5) The market-to-book ratio of Carolina Water Service, Inc. at March 28, 2005 is assumed to be equal to the average market-to-book ratio at March 28, 2005 of the proxy group of six AUS Utility Reports Water Companies.
  - (6) Carolina Water Service, Inc.'s common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at March 28, 2005 of the proxy group of six AUS Utility Reports water companies, 232.8%, and Carolina Water Service, Inc.'s market capitalization at March 28, 2005 would therefore have been \$30.825 million. (\$30.825 = \$13.241 \* 232.8%).
  - (7) The market-to-book ratio of Carolina Water Service, Inc. at March 28, 2005 is assumed to be equal to the average market-to-book ratio at March 28, 2005 of the proxy group of three Value Line (Standard Edition) water companies.
  - (8) Carolina Water Service, Inc.'s common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at March 28, 2005 of the proxy group of three Value Line (Standard Edition) water companies, 238.5%, and Carolina Water Service, Inc.'s market capitalization at March 28, 2005 would therefore have been \$31.580 million. (\$31.580 = \$13.241 \* 238.5%).

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus Research Insight Data Base  
Application of Carolina Water Service, Inc. for adjustment of rates and charges for the provision of water and sewer service and modification of rate  
schedules, Schedule A

Stocks, Bonds, Bills,  
and Inflation

**SBBI**

**Valuation Edition**  
2005 Yearbook

**Ibbotson**Associates



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# Chapter 7

## Firm Size and Return

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### The Firm Size Phenomenon

One of the most remarkable discoveries of modern finance is that of a relationship between firm size and return. The relationship cuts across the entire size spectrum but is most evident among smaller companies, which have higher returns on average than larger ones. Many studies have looked at the effect of firm size on return.<sup>1</sup> In this chapter, the returns across the entire range of firm size are examined.

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### Construction of the Decile Portfolios

The portfolios used in this chapter are those created by the Center for Research in Security Prices (CRSP) at the University of Chicago's Graduate School of Business. CRSP has refined the methodology of creating size-based portfolios and has applied this methodology to the entire universe of NYSE/AMEX/NASDAQ-listed securities going back to 1926.

The New York Stock Exchange universe excludes closed-end mutual funds, preferred stocks, real estate investment trusts, foreign stocks, American Depositary Receipts, unit investment trusts, and Americus Trusts. All companies on the NYSE are ranked by the combined market capitalization of their eligible equity securities. The companies are then split into 10 equally populated groups, or deciles. Eligible companies traded on the American Stock Exchange (AMEX) and the Nasdaq National Market (NASDAQ) are then assigned to the appropriate deciles according to their capitalization in relation to the NYSE breakpoints. The portfolios are rebalanced, using closing prices for the last trading day of March, June, September, and December. Securities added during the quarter are assigned to the appropriate portfolio when two consecutive month-end prices are available. If the final NYSE price of a security that becomes delisted is a month-end price, then that month's return is included in the quarterly return of the security's portfolio. When a month-end NYSE price is missing, the month-end value of the security is derived from merger terms, quotations on regional exchanges, and other sources. If a month-end value still is not determined, the last available daily price is used.

Base security returns are monthly holding period returns. All distributions are added to the month-end prices, and appropriate price adjustments are made to account for stock splits and dividends. The return on a portfolio for one month is calculated as the weighted average of the returns for its individual stocks. Annual portfolio returns are calculated by compounding the monthly portfolio returns.

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### Size of the Deciles

Table 7-1 reveals that the top three deciles of the NYSE/AMEX/NASDAQ account for most of the total market value of its stocks. Approximately two-thirds of the market value is represented by the first decile, which currently consists of 172 stocks, while the smallest decile accounts for just over one percent of the market value. The data in the second column of Table 7-1 are averages across all

<sup>1</sup> Rolf W. Banz was the first to document this phenomenon. See Banz, Rolf W. "The Relationship Between Returns and Market Value of Common Stocks," *Journal of Financial Economics*, Vol. 9, 1981, pp. 3-18.

79 years. Of course, the proportion of market value represented by the various deciles varies from year to year.

Columns three and four give recent figures on the number of companies and their market capitalization, presenting a snapshot of the structure of the deciles near the end of 2004.

Table 7-1  
Size-Decile Portfolios of the NYSE/AMEX/NASDAQ Size and Composition  
1926-2004

Decile	Historical Average Percentage of Total Capitalization	Recent Number of Companies	Recent Decile Market Capitalization (in thousands)	Recent Percentage of Total Capitalization
1-Largest	63.31%	172	\$8,214,688,366	63.16%
2	13.97%	177	1,722,153,325	13.24%
3	7.58%	199	894,917,914	6.88%
4	4.74%	209	548,389,454	4.22%
5	3.24%	219	400,381,543	3.08%
6	2.37%	257	325,662,936	2.50%
7	1.73%	300	264,131,617	2.03%
8	1.28%	372	219,976,996	1.69%
9	0.98%	589	230,476,080	1.77%
10-Smallest	0.80%	1,782	185,820,318	1.43%
Mid-Cap 3-5	15.56%	627	1,843,688,910	14.18%
Low-Cap 6-8	5.38%	929	809,771,549	6.23%
Micro-Cap 9-10	1.79%	2,371	416,296,398	3.20%

Source: © 200503 CRSP® Center for Research in Security Prices. Graduate School of Business, The University of Chicago. Used with permission. All rights reserved. [www.crsp.uchicago.edu](http://www.crsp.uchicago.edu)

Historical average percentage of total capitalization shows the average, over the last 79 years, of the decile market values as a percentage of the total NYSE/AMEX/NASDAQ calculated each month. Number of companies in deciles, recent market capitalization of deciles, and recent percentage of total capitalization are as of September 30, 2004.

Table 7-2 gives the current breakpoints that define the composition of the NYSE/AMEX/NASDAQ size deciles. The largest company and its market capitalization are presented for each decile. Table 7-3 shows the historical breakpoints for each of the three size groupings presented throughout this chapter. Mid-cap stocks are defined here as the aggregate of deciles 3-5. Based on the most recent data (Table 7-2), companies within this mid-cap range have market capitalizations at or below \$6,241,953,000 but greater than \$1,607,854,000. Low-cap stocks include deciles 6-8 and currently include all companies in the NYSE/AMEX/NASDAQ with market capitalizations at or below \$1,607,854,000 but greater than \$505,437,000. Micro-cap stocks include deciles 9-10 and include companies with market capitalizations at or below \$505,437,000. The market capitalization of the smallest company included in the micro-capitalization group is currently \$1,393,000.

Table 7-2

Size-Decile Portfolios of the NYSE/AMEX/NASDAQ, Largest Company and Its Market Capitalization by Decile  
September 30, 2004

Decile	Market Capitalization of Largest Company (in thousands)	Company Name
1-Largest	\$342,087,219	General Electric Co.
2	14,096,886	Agilent Technologies Inc.
3	6,241,953	Tenet Healthcare Corp.
4	3,464,104	Wellchoice Inc.
5	2,231,707	OGE Energy Corp.
6	1,607,854	Entercom Communications Corp.
7	1,097,603	Vintage Petroleum Inc.
8	746,219	Wabash National Corp.
9	505,437	World Fuel Services Corp.
10-Smallest	262,725	Mastec Inc.

Source: Center for Research in Security Prices, University of Chicago.

### Presentation of the Decile Data

Summary statistics of annual returns of the 10 deciles over 1926-2004 are presented in Table 7-4. Note from this exhibit that both the average return and the total risk, or standard deviation of annual returns, tend to increase as one moves from the largest decile to the smallest. Furthermore, the serial correlations of returns are near zero for all but the smallest two deciles. Serial correlations and their significance will be discussed in detail later in this chapter.

Graph 7-1 depicts the growth of one dollar invested in each of three NYSE/AMEX/NASDAQ groups broken down into mid-cap, low-cap, and micro-cap stocks. The index value of the entire NYSE/AMEX/NASDAQ is also included. All returns presented are value-weighted based on the market capitalizations of the deciles contained in each subgroup. The sheer magnitude of the size effect in some years is noteworthy. While the largest stocks actually declined in 1977, the smallest stocks rose more than 20 percent. A more extreme case occurred in the depression-recovery year of 1933, when the difference between the first and tenth decile returns was far more substantial. This divergence in the performance of small and large company stocks is a common occurrence.

Table 7-3

**Size-Decile Portfolios of the NYSE/AMEX/NASDAQ**  
Largest and Smallest Company by Size Group

from 1926 to 1965

Date (Sept 30)	Capitalization of Largest Company (in thousands)			Capitalization of Smallest Company (in thousands)		
	Mid-Cap 3-5	Low-Cap 6-8	Micro-Cap 9-10	Mid-Cap 3-5	Low-Cap 6-8	Micro-Cap 9-10
1926	\$61,490	\$14,040	\$4,305	\$14,100	\$4,325	\$43
1927	\$65,281	\$14,746	\$4,450	\$15,311	\$4,496	\$72
1928	\$81,998	\$18,975	\$5,074	\$19,050	\$5,119	\$135
1929	\$107,085	\$24,328	\$5,875	\$24,480	\$5,915	\$126
1930	\$67,808	\$13,050	\$3,219	\$13,068	\$3,264	\$30
1931	\$42,607	\$8,142	\$1,905	\$8,222	\$1,927	\$15
1932	\$12,431	\$2,170	\$473	\$2,196	\$477	\$19
1933	\$40,298	\$7,210	\$1,830	\$7,280	\$1,875	\$100
1934	\$38,129	\$6,669	\$1,669	\$6,734	\$1,673	\$68
1935	\$37,631	\$6,519	\$1,350	\$6,549	\$1,383	\$38
1936	\$46,920	\$11,505	\$2,660	\$11,526	\$2,668	\$98
1937	\$51,750	\$13,601	\$3,500	\$13,635	\$3,539	\$68
1938	\$36,102	\$8,325	\$2,125	\$8,372	\$2,145	\$60
1939	\$35,784	\$7,367	\$1,697	\$7,389	\$1,800	\$75
1940	\$31,050	\$7,990	\$1,861	\$8,007	\$1,872	\$51
1941	\$31,744	\$8,316	\$2,086	\$8,336	\$2,087	\$72
1942	\$26,135	\$6,870	\$1,779	\$6,875	\$1,788	\$82
1943	\$43,218	\$11,475	\$3,847	\$11,480	\$3,903	\$395
1944	\$46,621	\$13,066	\$4,800	\$13,068	\$4,812	\$309
1945	\$55,268	\$17,325	\$6,413	\$17,575	\$6,428	\$225
1946	\$79,158	\$24,192	\$10,013	\$24,199	\$10,051	\$829
1947	\$57,830	\$17,735	\$6,373	\$17,872	\$6,380	\$747
1948	\$67,238	\$19,575	\$7,313	\$19,651	\$7,329	\$784
1949	\$55,506	\$14,549	\$5,037	\$14,577	\$5,108	\$379
1950	\$65,881	\$18,675	\$6,176	\$18,750	\$6,201	\$303
1951	\$82,517	\$22,750	\$7,567	\$22,860	\$7,598	\$668
1952	\$97,936	\$25,452	\$8,428	\$25,532	\$8,480	\$480
1953	\$98,595	\$25,374	\$8,156	\$25,395	\$8,168	\$459
1954	\$125,834	\$29,645	\$8,484	\$29,707	\$8,488	\$463
1955	\$170,829	\$41,445	\$12,353	\$41,681	\$12,366	\$553
1956	\$183,434	\$46,805	\$13,481	\$46,886	\$13,524	\$1,122
1957	\$192,861	\$47,658	\$13,844	\$48,509	\$13,848	\$925
1958	\$195,083	\$46,774	\$13,789	\$46,871	\$13,816	\$550
1959	\$253,644	\$64,221	\$19,500	\$64,372	\$19,548	\$1,804
1960	\$246,202	\$61,485	\$19,344	\$61,529	\$19,385	\$831
1961	\$296,261	\$79,058	\$23,562	\$79,422	\$23,613	\$2,455
1962	\$250,433	\$58,866	\$18,952	\$59,143	\$18,968	\$1,018
1963	\$308,438	\$71,846	\$23,819	\$71,971	\$23,822	\$296
1964	\$344,033	\$79,343	\$25,594	\$79,508	\$25,595	\$223
1965	\$363,759	\$84,479	\$28,365	\$84,600	\$28,375	\$250

Source: Center for Research in Security Prices, University of Chicago.

Table 7-3 (continued)

**Size-Decile Portfolios of the NYSE/AMEX/NASDAQ**  
Largest and Smallest Company by Size Group

from 1966 to 2004

Date (Sept 30)	Capitalization of Largest Company (in thousands)			Capitalization of Smallest Company (in thousands)		
	Mid-Cap 3-5	Low-Cap 6-8	Micro-Cap 9-10	Mid-Cap 3-5	Low-Cap 6-8	Micro-Cap 9-10
1966	\$399,455	\$99,578	\$34,884	\$99,935	\$34,966	\$381
1967	\$459,170	\$117,985	\$42,267	\$118,329	\$42,313	\$381
1968	\$528,326	\$149,261	\$60,351	\$150,128	\$60,397	\$592
1969	\$517,452	\$144,770	\$54,273	\$145,684	\$54,280	\$2,119
1970	\$380,246	\$94,025	\$29,910	\$94,047	\$29,916	\$822
1971	\$542,517	\$145,340	\$45,571	\$145,673	\$45,589	\$865
1972	\$545,211	\$139,647	\$46,728	\$139,710	\$46,757	\$1,031
1973	\$424,584	\$94,809	\$29,601	\$95,378	\$29,606	\$561
1974	\$344,013	\$75,272	\$22,475	\$75,853	\$22,481	\$444
1975	\$465,763	\$96,954	\$28,140	\$97,266	\$28,144	\$540
1976	\$551,071	\$116,184	\$31,987	\$116,212	\$32,002	\$564
1977	\$573,084	\$135,804	\$39,192	\$137,323	\$39,254	\$513
1978	\$572,967	\$159,778	\$46,621	\$160,524	\$46,629	\$830
1979	\$661,336	\$174,480	\$49,088	\$174,517	\$49,172	\$948
1980	\$754,562	\$194,012	\$48,671	\$194,241	\$48,953	\$549
1981	\$954,665	\$259,028	\$71,276	\$261,059	\$71,289	\$1,446
1982	\$762,028	\$205,590	\$54,675	\$206,536	\$54,883	\$1,060
1983	\$1,200,680	\$352,698	\$103,443	\$352,944	\$103,530	\$2,025
1984	\$1,068,972	\$314,650	\$90,419	\$315,214	\$90,659	\$2,093
1985	\$1,432,342	\$367,413	\$93,810	\$368,249	\$94,000	\$760
1986	\$1,857,621	\$444,827	\$109,956	\$445,648	\$109,975	\$706
1987	\$2,059,143	\$467,430	\$112,035	\$468,948	\$112,125	\$1,277
1988	\$1,957,926	\$420,257	\$94,268	\$421,340	\$94,302	\$696
1989	\$2,147,608	\$480,975	\$100,285	\$483,623	\$100,384	\$96
1990	\$2,164,185	\$472,003	\$93,627	\$474,065	\$93,750	\$132
1991	\$2,129,863	\$457,958	\$87,586	\$458,853	\$87,733	\$278
1992	\$2,428,671	\$500,346	\$103,352	\$501,050	\$103,500	\$510
1993	\$2,711,068	\$608,520	\$137,945	\$608,825	\$137,987	\$602
1994	\$2,497,073	\$601,552	\$149,435	\$602,552	\$149,532	\$598
1995	\$2,793,761	\$653,178	\$158,011	\$654,019	\$158,063	\$89
1996	\$3,150,685	\$763,377	\$195,188	\$763,812	\$195,326	\$1,043
1997	\$3,511,132	\$818,299	\$230,472	\$821,028	\$230,554	\$480
1998	\$4,216,707	\$934,264	\$253,329	\$936,727	\$253,336	\$1,671
1999	\$4,251,741	\$875,309	\$218,336	\$875,582	\$218,368	\$1,502
2000	\$4,143,902	\$840,000	\$192,598	\$840,730	\$192,721	\$1,462
2001	\$5,252,063	\$1,114,792	\$269,275	\$1,115,200	\$270,391	\$443
2002	\$5,012,705	\$1,143,845	\$314,042	\$1,144,452	\$314,174	\$501
2003	\$4,794,027	\$1,166,799	\$330,608	\$1,167,040	\$330,797	\$332
2004	\$6,241,953	\$1,607,854	\$505,437	\$1,607,931	\$506,410	\$1,393

Source: Center for Research in Security Prices, University of Chicago.

Table 7-4  
Size-Decile Portfolios of the NYSE/AMEX/NASDAQ, Summary Statistics of Annual Returns  
1926-2004

Decile	Geometric Mean	Arithmetic Mean	Standard Deviation	Serial Correlation
1-Largest	9.6%	11.4%	19.27%	0.09
2	10.9	13.2	22.00	0.03
3	11.3	13.8	23.81	-0.02
4	11.3	14.4	26.10	-0.02
5	11.7	15.0	26.94	-0.02
6	11.8	15.5	27.97	0.04
7	11.6	15.7	30.17	0.01
8	11.9	16.7	33.65	0.04
9	12.2	17.7	36.77	0.05
10-Smallest	14.0	21.8	45.67	0.15
Mid-Cap, 3-5	11.4	14.2	24.90	-0.02
Low-Cap, 6-8	11.8	15.8	29.68	0.03
Micro-Cap, 9-10	12.8	19.0	39.38	0.08
NYSE/AMEX/NASDAQ				
Total Value-Weighted Index	10.1	12.1	20.32	0.03

Source: Center for Research in Security Prices, University of Chicago.

### Aspects of the Firm Size Effect

The firm size phenomenon is remarkable in several ways. First, the greater risk of small stocks does not, in the context of the capital asset pricing model (CAPM), fully account for their higher returns over the long term. In the CAPM, only systematic or beta risk is rewarded; small company stocks have had returns in excess of those implied by their betas.

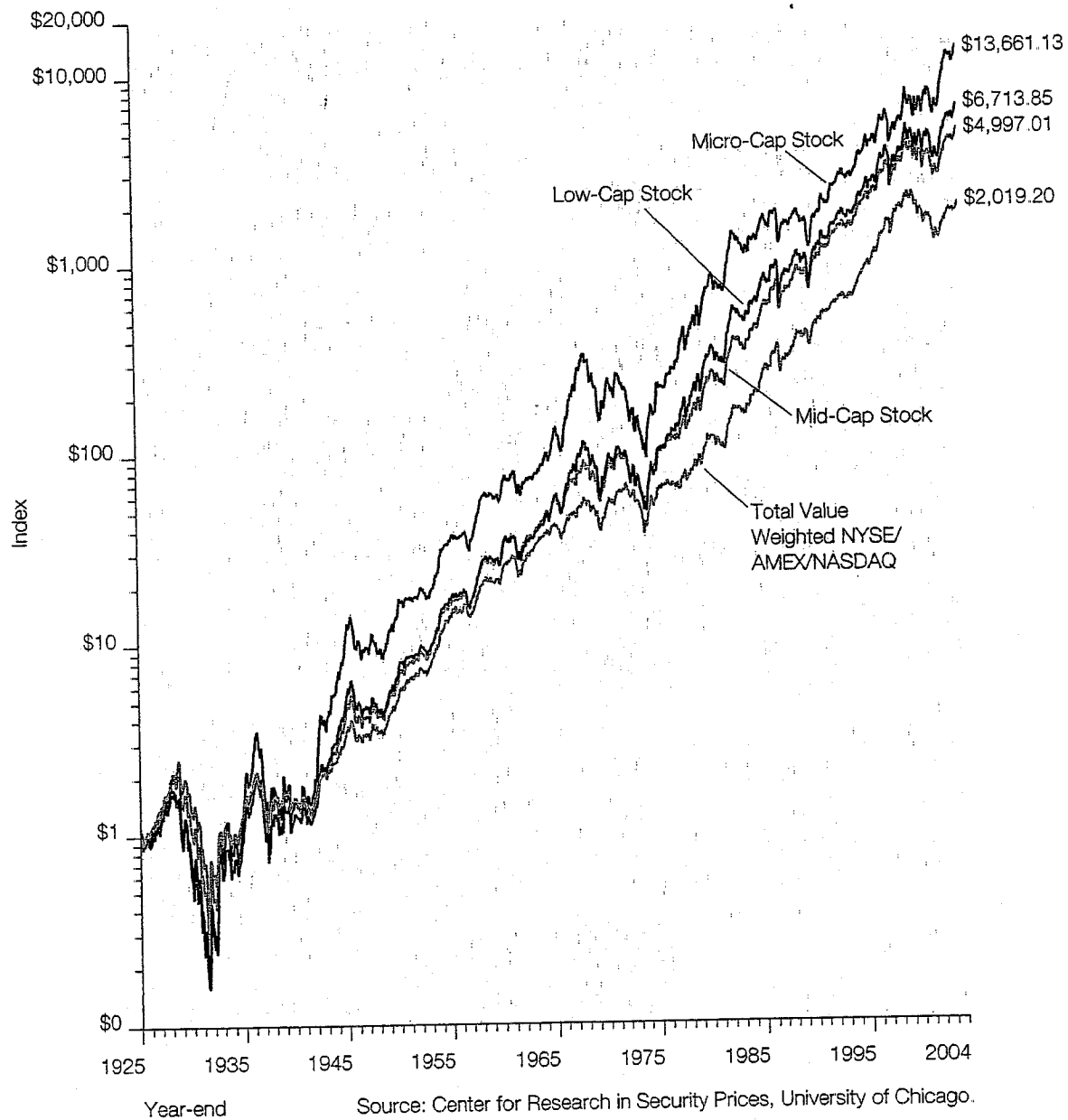
Second, the calendar annual return differences between small and large companies are serially correlated. This suggests that past annual returns may be of some value in predicting future annual returns. Such serial correlation, or autocorrelation, is practically unknown in the market for large stocks and in most other equity markets but is evident in the size premia.

Third, the firm size effect is seasonal. For example, small company stocks outperformed large company stocks in the month of January in a large majority of the years. Such predictability is surprising and suspicious in light of modern capital market theory. These three aspects of the firm size effect—long-term returns in excess of systematic risk, serial correlation, and seasonality—will be analyzed thoroughly in the following sections.

Graph 7-1

Size-Decile Portfolios of the NYSE/AMEX/NASDAQ: Wealth Indices of Investments in Mid-, Low-, Micro- and Total Capitalization Stocks  
1925-2004

Year-end 1925 = \$1.00



### Long-Term Returns in Excess of Systematic Risk

The capital asset pricing model (CAPM) does not fully account for the higher returns of small company stocks. Table 7-5 shows the returns in excess of systematic risk over the past 79 years for each decile of the NYSE/AMEX/NASDAQ. Recall that the CAPM is expressed as follows:

$$k_s = r_f + (\beta_s \times \text{ERP})$$

Table 7-5 uses the CAPM to estimate the return in excess of the riskless rate and compares this estimate to historical performance. According to the CAPM, the expected return on a security should consist of the riskless rate plus an additional return to compensate for the systematic risk of the security. The return in excess of the riskless rate is estimated in the context of the CAPM by multiplying the equity risk premium by  $\beta$  (beta). The equity risk premium is the return that compensates investors for taking on risk equal to the risk of the market as a whole (systematic risk).<sup>2</sup> Beta measures the extent to which a security or portfolio is exposed to systematic risk.<sup>3</sup> The beta of each decile indicates the degree to which the decile's return moves with that of the overall market.

A beta greater than one indicates that the security or portfolio has greater systematic risk than the market; according to the CAPM equation, investors are compensated for taking on this additional risk. Yet, Table 7-5 illustrates that the smaller deciles have had returns that are not fully explainable by their higher betas. This return in excess of that predicted by CAPM increases as one moves from the largest companies in decile 1 to the smallest in decile 10. The excess return is especially pronounced for micro-cap stocks (deciles 9–10). This size-related phenomenon has prompted a revision to the CAPM, which includes a size premium. Chapter 4 presents this modified CAPM theory and its application in more detail.

This phenomenon can also be viewed graphically, as depicted in the Graph 7-2. The security market line is based on the pure CAPM without adjustment for the size premium. Based on the risk (or beta) of a security, the expected return lies on the security market line. However, the actual historic returns for the smaller deciles of the NYSE/AMEX/NASDAQ lie above the line, indicating that these deciles have had returns in excess of that which is appropriate for their systematic risk.

<sup>2</sup> The equity risk premium is estimated by the 79-year arithmetic mean return on large company stocks, 12.39 percent, less the 79-year arithmetic mean income-return component of 20-year government bonds as the historical riskless rate, in this case 5.22 percent. (It is appropriate, however, to match the maturity, or duration, of the riskless asset with the investment horizon.) See Chapter 5 for more detail on equity risk premium estimation.

<sup>3</sup> Historical betas were calculated using a simple regression of the monthly portfolio (decile) total returns in excess of the 30-day U.S. Treasury bill total returns versus the S&P 500 total returns in excess of the 30-day U.S. Treasury bill, January 1926–December 2004. See Chapter 6 for more detail on beta estimation.



Table 7-5

Long-Term Returns in Excess of CAPM Estimation for Decile Portfolios of the NYSE/AMEX/NASDAQ  
1926-2004

Decile	Beta*	Arithmetic Mean Return	Realized Return in Excess of Riskless Rate**	Estimated Return in Excess of Riskless Rate†	Size Premium (Return in Excess of CAPM)
1-Largest	0.91	11.39%	6.16%	6.53%	-0.37%
2	1.04	13.24%	8.02%	7.42%	0.60%
3	1.10	13.84%	8.62%	7.86%	0.75%
4	1.13	14.38%	9.15%	8.08%	1.07%
5	1.16	14.96%	9.74%	8.30%	1.44%
6	1.18	15.46%	10.23%	8.48%	1.75%
7	1.23	15.67%	10.45%	8.83%	1.61%
8	1.28	16.74%	11.51%	9.15%	2.36%
9	1.34	17.71%	12.48%	9.62%	2.86%
10-Smallest	1.41	21.77%	16.54%	10.14%	6.41%
Mid-Cap, 3-5	1.12	14.19%	8.96%	8.01%	0.95%
Low-Cap, 6-8	1.22	15.76%	10.54%	8.73%	1.81%
Micro-Cap, 9-10	1.36	18.97%	13.74%	9.72%	4.02%

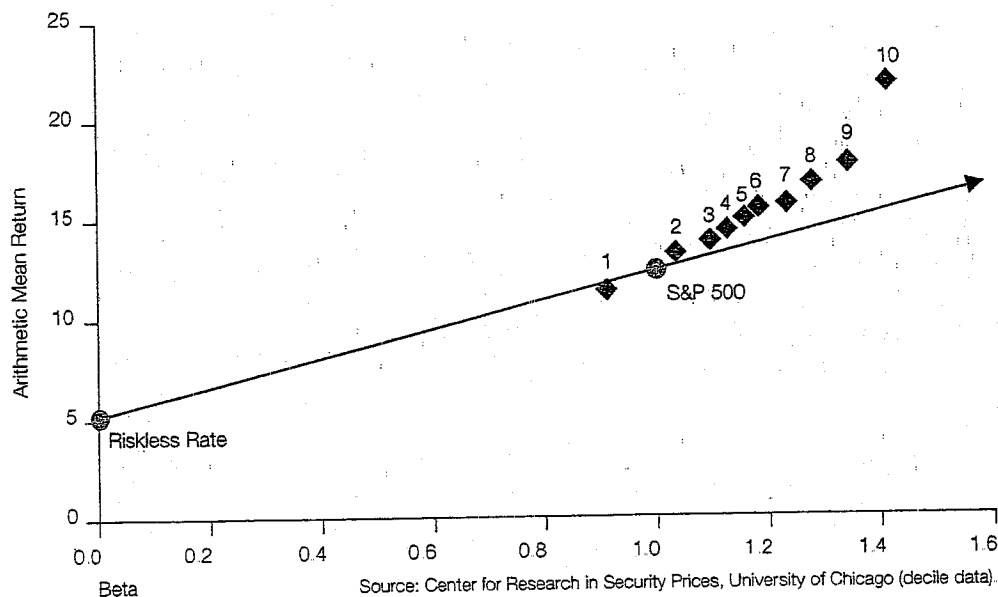
\*Betas are estimated from monthly portfolio total returns in excess of the 30-day U.S. Treasury bill total return versus the S&P 500 total returns in excess of the 30-day U.S. Treasury bill, January 1926-December 2004.

\*\*Historical riskless rate is measured by the 79-year arithmetic mean income return component of 20-year government bonds (5.22 percent).

†Calculated in the context of the CAPM by multiplying the equity risk premium by beta. The equity risk premium is estimated by the arithmetic mean total return of the S&P 500 (12.39 percent) minus the arithmetic mean income return component of 20-year government bonds (5.22 percent) from 1926-2004.

Graph 7-2

Security Market Line versus Size-Decile Portfolios of the NYSE/AMEX/NASDAQ  
1926-2004



### Further Analysis of the 10th Decile

The size premia presented thus far do a great deal to explain the return due solely to size in publicly traded companies. However, by splitting the 10th decile into two size groupings we can get a closer look at the smallest companies. This magnification of the smallest companies will demonstrate whether the company size to size premia relationship continues to hold true.

As previously discussed, the method for determining the size groupings for size premia analysis was to take the stocks traded on the NYSE and break them up into 10 deciles, after which stocks traded on the AMEX and NASDAQ were allocated into the same size groupings. This same methodology was used to split the 10th decile into two parts: 10a and 10b, with 10b being the smaller of the two. This is equivalent to breaking the stocks down into 20 size groupings, with portfolios 19 and 20 representing 10a and 10b.

Table 7-7 shows that the pattern continues; as companies get smaller their size premium increases. There is a noticeable increase in size premium from 10a to 10b, which can also be demonstrated visually in Graph 7-3. This can be useful in valuing companies that are extremely small. Table 7-6 presents the size, composition, and breakpoints of deciles 10a and 10b. First, the recent number of companies and total decile market capitalization are presented. Then the largest company and its market capitalization are presented.

Breaking the smallest decile down lowers the significance of the results compared to results for the 10th decile taken as a whole, however. The same holds true for comparing the 10th decile with the Micro-Cap aggregation of the 9th and 10th deciles. The more stocks included in a sample the more significance can be placed on the results. While this is not as much of a factor with the recent years of data, these size premia are constructed with data back to 1926. By breaking the 10th decile down into smaller components we have cut the number of stocks included in each grouping. The change over time of the number of stocks included in the 10th decile for the NYSE/AMEX/NASDAQ is presented in Table 7-8. With fewer stocks included in the analysis early on, there is a strong possibility that just a few stocks can dominate the returns for those early years.

While the number of companies included in the 10th decile for the early years of our analysis is low, it is not too low to still draw meaningful results even when broken down into subdivisions 10a and 10b. All things considered, size premia developed for deciles 10a and 10b are significant and can be used in cost of capital analysis. These size premia should greatly enhance the development of cost of capital analysis for very small companies.

Table 7-6  
Size-Decile Portfolios 10a and 10b of the NYSE/AMEX/NASDAQ,  
Largest Company and Its Market Capitalization  
September 30, 2004

Decile	Recent Number of Companies	Recent Decile Market Capitalization (in thousands)	Market Capitalization of Largest Company (in thousands)	Company Name
10a	532	\$98,581,341	\$262,725	Mastec Inc.
10b	1,261	\$83,633,980	\$143,916	Rex Stores Corp.

Note: These numbers may not aggregate to equal decile 10 figures.  
Source: Center for Research in Security Prices, University of Chicago.

Table 7-7

Long-Term Returns in Excess of CAPM Estimation for Decile Portfolios of the NYSE/AMEX/NASDAQ, with 10th Decile Split 1926-2004

	Beta*	Arithmetic Mean Return	Realized Return in Excess of Riskless Rate**	Estimated Return in Excess of Riskless Rate†	Size Premium (Return in Excess of CAPM)
1-Largest	0.91	11.39%	6.16%	6.53%	-0.37%
2	1.04	13.24%	8.02%	7.42%	0.60%
3	1.10	13.84%	8.62%	7.86%	0.75%
4	1.13	14.38%	9.15%	8.08%	1.07%
5	1.16	14.96%	9.74%	8.30%	1.44%
6	1.18	15.46%	10.23%	8.48%	1.75%
7	1.23	15.67%	10.45%	8.83%	1.61%
8	1.28	16.74%	11.51%	9.15%	2.36%
9	1.34	17.71%	12.48%	9.62%	2.86%
10a	1.42	19.95%	14.73%	10.19%	4.54%
10b-Smallest	1.39	25.13%	19.90%	10.00%	9.90%
Mid-Cap, 3-5	1.12	14.19%	8.96%	8.01%	0.95%
Low-Cap, 6-8	1.22	15.76%	10.54%	8.73%	1.81%
Micro-Cap, 9-10	1.36	18.97%	13.74%	9.72%	4.02%

\*Betas are estimated from monthly portfolio total returns in excess of the 30-day U.S. Treasury bill total return versus the S&P 500 total returns in excess of the 30-day U.S. Treasury bill, January 1926-December 2004.

\*\*Historical riskless rate is measured by the 79-year arithmetic mean income return component of 20-year government bonds (5.22 percent).

†Calculated in the context of the CAPM by multiplying the equity risk premium by beta. The equity risk premium is estimated by the arithmetic mean total return of the S&P 500 (12.39 percent) minus the arithmetic mean income return component of 20-year government bonds (5.22 percent) from 1926-2004.

Graph 7-3

Security Market Line versus Size-Decile Portfolios of the NYSE/AMEX/NASDAQ, with 10th Decile Split 1926-2004

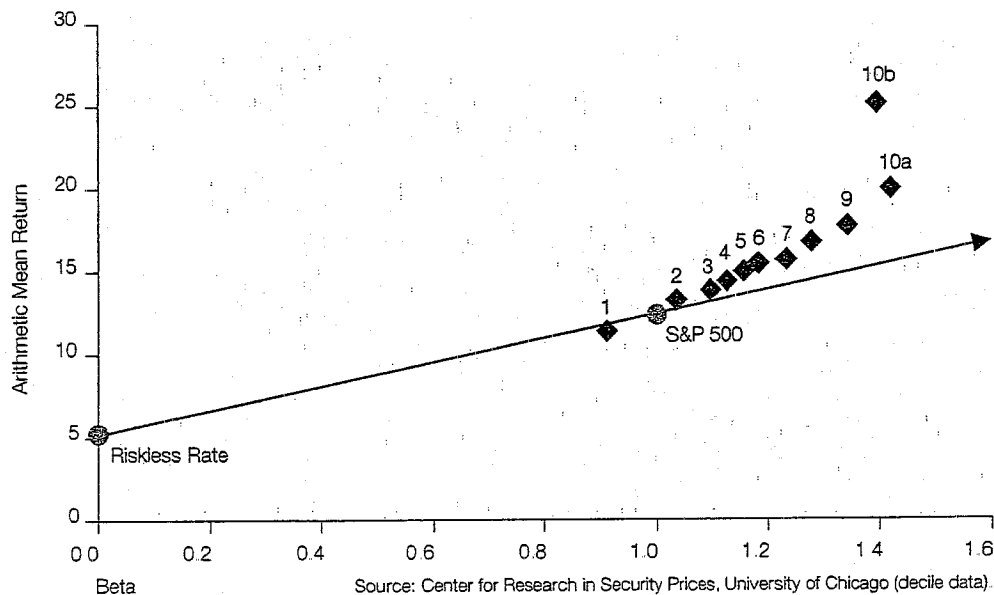


Table 7-8  
Historical Number of Companies for NYSE/AMEX/NASDAQ Decile 10

Sept.	Number of Companies
1926	52*
1930	72
1940	78
1950	100
1960	109
1970	865
1980	685
1990	1,814
2000	1,927
2004	1,782

\*The fewest number of companies was 49 in March, 1926

Source: Center for Research in Security Prices, University of Chicago.

### Alternative Methods of Calculating the Size Premia

The size premia estimation method presented above makes several assumptions with respect to the market benchmark and the measurement of beta. The impact of these assumptions can best be examined by looking at some alternatives. In this section we will examine the impact on the size premia of using a different market benchmark for estimating the equity risk premia and beta. We will also examine the effect on the size premia study of using sum beta or an annual beta.<sup>4</sup>

### Changing the Market Benchmark

In the original size premia study, the S&P 500 is used as the market benchmark in the calculation of the realized historical equity risk premium and of each size group's beta. The NYSE total value-weighted index is a common alternative market benchmark used to calculate beta. Table 7-9 uses this market benchmark in the calculation of beta. In order to isolate the size effect, we require an equity risk premium based on a large company stock benchmark. The NYSE deciles 1-2 large company index offers a mutually exclusive set of portfolios for the analysis of the smaller company groups: mid-cap deciles 3-5, low-cap deciles 6-8, and micro-cap deciles 9-10. The size premia analyses using these benchmarks are summarized in Table 7-9 and depicted graphically in Graph 7-4.

For the entire period analyzed, 1926-2004, the betas obtained using the NYSE total value-weighted index are higher than those obtained using the S&P 500. Since smaller companies had higher betas using the NYSE benchmark, one would expect the size premia to shrink. However, as was illustrated in Chapter 5, the equity risk premium calculated using the NYSE deciles 1-2 benchmark results in a value of 6.40, as opposed to 7.17 when using the S&P 500. The effect of the higher betas and lower equity risk premium cancel each other out, and the resulting size premia in Table 7-9 are slightly higher than those resulting from the original study.

4 Sum beta is the method of beta estimation described in Chapter 6 that was developed to better account for the lagged reaction of small stocks to market movements. The sum beta methodology was developed for the same reason that the size premia were developed; small company betas were too small to account for all of their excess returns.

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# Utilities

The utilities rating methodology encompasses two basic components: business risk analysis and financial analysis. Evaluation of industry characteristics, the utility's position within that industry, its regulation, and its management provides the context for assessing a firm's financial condition.

Historical analysis is a tool for identifying strengths and weaknesses, and provides a starting point for evaluating financial condition. Business position assessment is the qualitative measure of a utility's fundamental creditworthiness. It focuses on the forces that will shape the utilities' future.

## Utilities credit analysis factors

### Business risk

- Markets and service area economy
- Competitive position
- Operations
- Regulation
- Management
- Fuel, power, and water supply
- Asset concentration

### Financial risk

- Earnings protection
- Capital structure
- Cash flow adequacy
- Financial flexibility/capital attraction

The credit analysis of utilities is quickly evolving, as utilities are treated less as regulated monopolies and more as entities faced with a host of challengers in a competitive environment. Marketplace dynamics are supplanting the power of regulation, making it critically important to reduce costs and/or market new services in order to thwart competitors' inroads.

## Markets and service area economy

Assessing service territory begins with the economic and demographic evaluation of the area in which the utility has its franchise. Strength of long-term demand for the product is examined from a macroeconomic perspective. This enables Standard & Poor's to evaluate the affordability of rates and the staying power of demand.

Standard & Poor's tries to discern any secular consumption trends and, more importantly, the reasons for them. Specific items examined include the size and growth rate of the market, strength of the franchise, historical and projected sales growth, income levels and trends in population, employment, and per capita income. A utility with a healthy economy and customer base—as illustrated by diverse employment opportunities, average or above-average wealth and income statistics, and low unemployment—will have a greater capacity to support its operations.

ment—will have a greater capacity to support its operations.

For electric and gas utilities, distribution by customer class is scrutinized to assess the depth and diversity of the utility's customer mix. For example, heavy industrial concentration is viewed cautiously, since a utility may have significant exposure to cyclical volatility. Alternatively, a large residential component yields a stable and more predictable revenue stream. The largest utility customers are identified to determine their importance to the bottom line and assess the risk of their loss and potential adverse effect on the utility's financial position. Credit concerns arise when individual customers represent more than 5% of revenues. The company or industry may play a significant role in the overall economic base of the service area. Moreover, large customers may turn to cogeneration or alternative power supplies to meet their energy needs, potentially leading to reduced cash flow for the utility (even in cases where a large customer pays discounted rates and is not a profitable account for the utility). Customer concentration is less significant for water and telecommunication utilities.

## Competitive position

As competitive pressures have intensified in the utilities industry, Standard & Poor's analysis has deepened to include a more thorough review of competitive position.

### Electric utility competition

For electric utilities, competitive factors examined include: percentage of firm wholesale revenues that are most vulnerable to competition; industrial load concentration; exposure of key customers to alternative suppliers; commercial concentrations; rates for various customer classes; rate design and flexibility; production costs, both marginal and fixed; the regional capacity situation; and transmission constraints. A regional focus is evident, but high costs and rates relative to national averages are also of significant concern because of the potential for electricity substitutes over time.

Mounting competition in the electric utility industry derives from excess generating capacity, lower barriers to entering the electric generating business, and marginal costs that are below embedded costs. Standard & Poor's has already witnessed declining prices in wholesale markets, as *de facto* retail competition is already being seen in several parts of the country. Standard & Poor's believes that over the coming years more and more customers will want and demand lower prices. Initial concerns focus on the largest industrial loads, but other customer classes will be increasingly vulnerable. Competition will not necessarily

ily be driven by legislation. Other pressures will arise from global competition and improving technologies, whether it be the declining cost of incremental generation or advances in transmission capacity or substitute energy sources like the fuel cell. It is impossible to say precisely when wide-open retail competition will occur; this will be evolutionary. However, significantly greater competition in retail markets is inevitable.

#### **Gas utility competition**

Similarly, gas utilities are analyzed with regard to their competitive standing in the three major areas of demand: residential, commercial, and industrial. Although regulated as holders of monopoly power, natural gas utilities have for some time been actively competing for energy market share with fuel oil, electricity, coal, solar, wood, etc. The long-term staying power of market demand for natural gas cannot be taken for granted. In fact, as the electric utility industry restructures and reduces costs, electric power will become more cost competitive and threaten certain gas markets. In addition, independent gas marketers have made greater inroads behind the city gate and are competing for large gas users. Moreover, the recent trend by state regulators to unbundle utility services is creating opportunities for outsiders to market niche products. Distributors still have the upper hand, but those who do not reduce and control costs, and thus rates, could find competition even more difficult.

Natural gas pipelines are judged to carry a somewhat higher business risk than distribution companies because they face competition in every one of their markets. To the extent a pipeline serves utilities versus industrial end users, its stability is greater. Over the next five years, pipeline competition will heat up since many service contracts with customers are expiring. Most distributor or end-use customers are looking to reduce pipeline costs and are working to improve their load factor to do so. Thus, pipelines will likely find it difficult to recontract all capacity in coming years. Being the pipeline of choice is a function of attractive transportation rates, diversity and quality of services provided, and capacity available in each particular market. In all cases though, periodic discounting of rates to retain customers will occur and put pressure on profitability.

#### **Water utility competition**

As the last true utility monopoly, water utilities face very little competition and there is currently no challenge to the continuation of franchise areas. The only exceptions have been cases where investor-owned water companies have been subject to condemnation and municipalization because of poor service or political motivations. In that regard, Standard & Poor's pays close attention to costs and rates in relation to neighboring utilities and national averages. (In contrast, the privatization of public water facilities has begun, albeit at a slower pace than anticipated. This is occurring mostly in the form of operating contracts and public/private partnerships, and not in asset transfers. This trend should continue as cities look for ways to bal-

ance their tight budgets.) Also, water utilities are not fully immune to the forces of competition; in a few instances wholesale customers can access more than one supplier.

#### **Telephone competition**

The Telecommunications Act of 1996 accelerates the continuing challenge to the local exchange companies' (LECs) century-old monopoly in the local loop. Competitive access providers (CAPs), both facilities-based and resellers, are aggressively pursuing customers, generally targeting metropolitan areas, and promising lower rates and better service.

Most long-distance calls are still originated and terminated on the local telephone company network. To complete such a call, the long-distance provider (including AT&T, MCI, Sprint and a host of smaller interexchange carriers or "IXCs") must pay the local telephone company a steep "access" fee to compensate the local phone company for the use of its local network. CAPs, in contrast, build or lease facilities that directly connect customers to their long-distance carrier, bypassing the local telephone company and avoiding access fees, and thereby can offer lower long-distance rates. But the LECs are not standing still; they are combating the loss of business to CAPs by lowering access fees, thereby reducing the economic incentive for a high usage long-distance customer to use a CAP. LECs are attempting to make up for the loss of revenues from lower access fees by increasing basic local service rates (or at least not lowering them), since basic service is far less subject to competition. LECs are improving operating efficiency and marketing high margin, value-added new services. Additionally, in the wake of the Telecommunications Act, LECs will capture at least some of the inter-LATA long-distance market. As a result of these initiatives, LECs continue to rebuild themselves—from the traditional utility monopoly to leaner, more marketing oriented organizations.

While LECs, and indeed all segments of the telecommunications sector, face increasing competition, there are favorable industry factors that tend to offset heightened business risk and auger for overall ratings stability for most LECs. Importantly, telecommunications is a declining-cost business. With increased deployment of fiber optics, the cost of transport has fallen dramatically and digital switching hardware and software have yielded more capable, trouble-free and cost-efficient networks. As a result, the cost of network maintenance has dropped sharply, as illustrated by the ratio of employees per 10,000 access lines, an oft cited measurement of efficiency. Ratios as low as 25 employees per 10,000 lines are being seen, down from the typical 40 or more employees per 10,000 ratio of only a few years ago.

In addition, networks are far more capable. They are increasingly digitally switched and able to accommodate high-speed communications. The infrastructure needed to accommodate switched broadband services will be built into telephone networks over the next few years. These advanced networks will enable telephone companies to look to a greater variety of high-margin, value-added serv-



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ices. In addition to those current services such as call waiting or caller ID, the delivery of hundreds of broadcast and interactive video channels will be possible. While these services offer the potential of new revenue streams, they will simultaneously present a formidable challenge. LECs will be entering the new (to them) arena of multimedia entertainment and will have to develop expertise in marketing and entertainment programming acumen; such skills stand in sharp contrast to LECs' traditional strengths in engineering and customer service.

## Operations

Standard & Poor's focuses on the nature of operations from the perspective of cost, reliability, and quality of service. Here, emphasis is placed on those areas that require management attention in terms of time or money and which, if unresolved, may lead to political, regulatory, or competitive problems.

### Operations of electric utilities

For electric utilities, the status of utility plant investment is reviewed with regard to generating plant availability and utilization, and also for compliance with existing and contemplated environmental and other regulatory standards. The record of plant outages, equivalent availability, load factors, heat rates, and capacity factors are examined. Also important is efficiency, as defined by total megawatt hour per employee and customers per employee. Transmission interconnections are evaluated in terms of the number of utilities to which the utility in question has access, the cost structures and available generating capacity of these other utilities, and the price paid for wholesale power.

Because of mounting competition and the substantial escalation in decommissioning estimates, significant weight is given to the operation of nuclear facilities. Nuclear plants are becoming more vulnerable to high production costs that make their rates uneconomic. Significant asset concentration may expose the utility to poor performance, unscheduled outages or premature shutdowns, and large deferrals or regulatory assets that may need to be written off for the utility to remain competitive. Also, nuclear facilities tend to represent significant portions of their operators' generating capability and assets. The loss of a productive nuclear unit from both power supply and rate base can interrupt the revenue stream and create substantial additional costs for repairs and improvements and replacement power. The ability to keep these stations running smoothly and economically directly influences the ability to meet electric demand, the stability of revenues and costs, and, by extension, the ability to maintain adequate creditworthiness. Thus, economic operation, safe operation, and long-term operation are examined in depth. Specifically, emphasis is placed on operation and maintenance costs, busbar costs, fuel costs, refueling outages, forced outages, plant statistics, NRC evaluations, the potential need for repairs, operating licenses, decommissioning estimates and amounts held in external trusts, spent fuel storage capacity, and management's nuclear experi-

ence. In essence, favorable nuclear operations offer significant opportunities but, if a nuclear unit runs poorly or not at all, the attendant risks can be great.

### Operations of gas utilities

For gas pipeline and distribution companies, the degree of plant utilization, the physical condition of the mains and lines, adequacy of storage to meet seasonal needs, "lost and unaccounted for" gas levels, and per-unit nongas operating and construction costs are important factors. Efficiency statistics such as load factor, operating costs per customer, and operating income per employee are also evaluated in comparison to other utilities and the industry as a whole.

### Operations of water utilities

As a group, water utilities are continually upgrading their physical plant to satisfy regulations and to develop additional supply. Over the next decade, water systems will increasingly face the task of maintaining compliance, as drinking water regulations change and infrastructure ages. Given that the Safe Drinking Water Act was authorized in 1974, the first generation of treatment plants built to conform with these rules are almost 20 years old. Additionally, because the focus during this period was on satisfying environmental standards, deferred maintenance of distribution systems has been common, especially in older urban areas. The increasing cost of supplying treated water argues against the high level of unaccounted for water witnessed in the industry. Consequently, Standard & Poor's anticipates capital plans for rebuilding distribution lines and major renewal and replacement efforts aimed at treatment plants.

### Operations of telephone companies

For telephone companies, cost-of-service analysis focuses on plant capability and measures of efficiency and quality of service. Plant capability is ascertained by looking at such parameters as percentage of digitally switched lines; fiber optic deployment, in particular in those portions of the plant key to network survival; and the degree of broadband capacity fiber and coaxial deployment and broadband switching capacity. Efficiency measures include operating margins, the ratio of employees per 10,000 access lines, and the extent of network and operations consolidation. Quality of service encompasses examination of quantitative measures, such as trouble reports and repeat service calls, as well as an assessment of qualitative factors, that may include service quality goals mandated by regulators.

## Regulation

Regulatory rate-setting actions are reviewed on a case-by-case basis with regard to the potential effect on creditworthiness. Regulators' authorizing high rates of return is of little value unless the returns are earnable. Furthermore, allowing high returns based on noncash items does not benefit bondholders. Also, to be viewed positively, regulatory treatment should allow consistent performance from

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period to period, given the importance of financial stability as a rating consideration.

The utility group meets frequently with commission and staff members, both at Standard & Poor's offices and at commission headquarters, demonstrating the importance Standard & Poor's places on the regulatory arena for credit quality evaluation. Input from these meetings and from review of rate orders and their impact weigh heavily in Standard & Poor's analysis.

Standard & Poor's does not "rate" regulatory commissions. State commissions typically regulate a number of diverse industries, and regulatory approaches to different types of companies often differ within a single regulatory jurisdiction. This makes it all but impossible to develop inclusive "ratings" for regulators.

Standard & Poor's evaluation of regulation also encompasses the administrative, judicial, and legislative processes involved in state and federal regulation. These can affect rate-setting activities and other aspects of the business, such as competitive entry, environmental and safety rules, facility siting, and securities sales.

As the utility industry faces an increasingly deregulated environment, alternatives to traditional rate-making are becoming more critical to the ability of utilities to effectively compete, maintain earnings power, and sustain creditor protection. Thus, Standard & Poor's focuses on whether regulators, both state and federal, will help or hinder utilities as they are exposed to greater competition. There is much that regulators can do, from allocating costs to more captive customers to allowing pricing flexibility—and sometimes just stepping out of the way.

Under traditional rate-making, rates and earnings are tied to the amount of invested capital and the cost of capital. This can sometimes reward companies more for justifying costs than for containing them. Moreover, most current regulatory policies do not permit utilities to be flexible when responding to competitive pressures of a deregulated market. Lack of flexible tariffs for electric utilities may lure large customers to wheel cheaper power from other sources.

In general, a regulatory jurisdiction is viewed favorably if it permits earning a return based on the ability to sustain rates at competitive levels. In addition to performance-based rewards or penalties, flexible plans could include market-based rates, price caps, index-based prices, and rates premised on the value of customer service. Such rates more closely mirror the competitive environment that utilities are confronting.

#### **Electric industry regulation**

The ability to enter into long-term arrangements at negotiated rates without having to seek regulatory approval for each contract is also important in the electric industry. (While contracting at reduced rates constrains financial performance, it lessens the potential adverse impact in the event of retail wheeling. Since revenue losses associated with this strategy are not likely to be recovered from ratepayers, utilities must control costs well enough to remain

competitive if they are to sustain current levels of bondholder protection.)

#### **Natural gas industry regulation**

In the gas industry, too, several state commission policies weigh heavily in the evaluation of regulatory support. Examples include stabilization mechanisms to adjust revenues for changes in weather or the economy, rate and service unbundling decisions, revenue and cost allocation between sales and transportation customers, flexible industrial rates, and the general supportiveness of construction costs and gas purchases.

#### **Water industry regulation**

In all water utility activities, federal and state environmental regulations continue to play a critical role. The legislative timetable to effect the 1986 amendments to the Safe Drinking Water Act of 1974 was quite aggressive. But environmental standards-setting has actually slowed over the past couple of years due largely to increasing sentiment that the stringent, costly standards have not been justified on the basis of public health. A moratorium on the promulgation of significant new environmental rules is anticipated.

#### **Telecommunications industry regulation**

Despite the advances in telecommunications deregulation, analysis of regulation of telephone operators will continue to be a key rating determinant for the foreseeable future. The method of regulation may be either classic rate-based rate of return or some form of price cap mechanism. The most important factor is to assess whether the regulatory framework—no matter which type—provides sufficient financial incentive to encourage the rated company to maintain its quality of service and to upgrade its plant to accommodate new services while facing increasing competition from wireless operators and cable television companies.

Where regulators do still set tariffs based on an authorized return, Standard & Poor's strives to explore with regulators their view of the rate-of-return components that can materially impact reported versus regulatory earnings. Specifically these include the allowable base upon which the authorized return can be earned, allowable expenses, and the authorized return. Since regulatory oversight runs the gamut from strict, adversarial relationships with the regulated operating companies to highly supportive postures, Standard & Poor's probes beyond the apparent regulatory environment to ascertain the actual impact of regulation on the rated company.

### **Management**

Evaluating the management of a utility is of paramount importance to the analytical process since management's abilities and decisions affect all areas of a company's operations. While regulation, the economy, and other outside factors can influence results, it is ultimately the quality of management that determines the success of a company.

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With emerging competition, utility management will be more closely scrutinized by Standard & Poor's and will become an increasingly critical component of the credit evaluation. Management strategies can be the key determinant in differentiating utilities and in establishing where companies lie on the business position spectrum. It is imperative that managements be adaptable, aggressive, and proactive if their utilities are to be viable in the future; this is especially important for utilities that are currently uncompetitive.

The assessment of management is accomplished through meetings, conversations, and reviews of company plans. It is based on such factors as tenure, industry experience, grasp of industry issues, knowledge of customers and their needs, knowledge of competitors, accounting and financing practices, and commitment to credit quality. Management's ability and willingness to develop workable strategies to address their systems' needs, to deal with the competitive pressures of free market, to execute reasonable and effective long-term plans, and to be proactive in leading their utilities into the future are assessed. Management quality is also indicated by thoughtful balancing of public and private priorities, a record of credibility, and effective communication with the public, regulatory bodies, and the financial community. Boards of directors will receive ever more attention with respect to their role in setting appropriate management incentives.

With competition the watchword, Standard & Poor's also focuses on management's efforts to enhance financial condition. Management can bolster bondholder protection by taking any number of discretionary actions, such as selling common equity, lowering the common dividend payout, and paying down debt. Also important for the electric industry will be creativity in entering into strategic alliances and working partnerships that improve efficiency, such as central dispatching for a number of utilities or locking up at-risk customers through long-term contracts or expanded flexible pricing agreements. Proactive management teams will also seek alternatives to traditional rate-base, rate-of-return rate-making, move to adopt higher depreciation rates for generating facilities, segment customers by individual market preferences, and attempt to create superior service organizations.

In general, management's ability to respond to mounting competition and changes in the utility industry in a swift and appropriate manner will be necessary to maintain credit health.

### ***Fuel, power, and water supply***

Assessment of present and prospective fuel and power supply is critical to every electric utility analysis, while gauging the long-term natural gas supply position for gas pipeline and distribution companies and the water resources of a water utility is equally important. There is no similar analytical category for telephone utilities.

#### **Electric utilities**

For electric utilities emphasis is placed on generating

reserve margins, fuel mix, fuel contract terms, demand-side management techniques, and purchased power arrangements. The adequacy of generating margins is examined nationally, regionally, and for each individual company. However, the reserve margin picture is muddied by the imprecise nature of peak-load growth forecasting, and also supply uncertainty relating to such things as Canadian capacity availability and potential plant shut-downs due to age, new NRC rules, acid rain remedies, fuel shortages, problems associated with nontraditional technologies, and so forth. Even apparently ample reserves may not be what they seem. Moreover, the quality of capacity is just as important as the size of reserves. Companies' reserve requirements differ, depending upon individual operating characteristics.

Fuel diversity provides flexibility in a changing environment. Supply disruptions and price hikes can raise rates and ignite political and regulatory pressures that ultimately lead to erosion in financial performance. Thus, the ability to alter generating sources and take advantage of lower cost fuels is viewed favorably.

Dependence on any single fuel means exposure to that fuel's problems: electric utilities that rely on oil or gas face the potential for shortages and rapid price increases; utilities that own nuclear generating facilities face escalating costs for decommissioning; and coal-fired capacity entails environmental problems stemming from concerns over acid rain and the "greenhouse effect."

Buying power from neighboring utilities, qualifying facility projects, or independent power producers may be the best choice for a utility that faces increasing electricity demand. There has been a growing reliance on purchased power arrangements as an alternative to new plant construction. This can be an important advantage, since the purchasing utility avoids potential construction cost overruns as well as risking substantial capital. Also, utilities can avoid the financial risks typical of a multiyear construction program that are caused by regulatory lag and prudence reviews. Furthermore, purchased power may enhance supply flexibility, fuel resource diversity, and maximize load factors. Utilities that plan to meet demand projections with a portfolio of supply-side options also may be better able to adapt to future growth uncertainties. Notwithstanding the benefits of purchasing, such a strategy has risks associated with it. By entering into a firm long-term purchased power contract that contains a fixed-cost component, utilities can incur substantial market, operating, regulatory, and financial risks. Moreover, regulatory treatment of purchased power removes any upside potential that might help offset the risks. Utilities are not compensated through incentive rate-making; rather, purchased power is recovered dollar-for-dollar as an operating expense.

To analyze the financial impact of purchased power, Standard & Poor's first calculates the net present value of future annual capacity payments (discounted at 10%). This represents a potential debt equivalent—the off-balance-sheet obligation that a utility incurs when it enters into a long-term purchased power contract. However, Standard

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& Poor's adds to the utility's balance sheet only a portion of this amount, recognizing that such a contractual arrangement is not entirely the equivalent of debt. What percentage is added is a function of Standard & Poor's qualitative analysis of the specific contract and the extent to which market, operating, and regulatory risks are borne by the utility (the risk factor). For unconditional, take-or-pay contracts, the risk factor range is from 40%-80%, with the average hovering around 60%. A lower risk factor is typically assigned for system purchases from coal-fired utilities and a higher risk factor is usually designated for unit-specific nuclear purchases. The range for take-and-pay performance obligations is between 10%-50%.

#### **Gas utilities**

For gas distribution utilities, long-term supply adequacy obviously is critical, but the supply role has become even more important in credit analysis since the Federal Energy Regulatory Commission's Order 636 eliminated the interstate pipeline merchant business. This thrust gas supply responsibilities squarely on local gas distributors. Standard & Poor's has always believed distributor management has the expertise and wherewithal to perform the job well, but the risks are significant since gas costs are such a large percentage of total utility costs. In that regard, it is important for utilities to get preapprovals of supply plans by state regulators or at least keep the staff and commissioners well informed. To minimize risks, a well-run program would diversify gas sources among different producers or marketers, different gas basins in the U.S. and Canada, and different pipeline routes. Also, purchase contracts should be firm, with minimal take-or-pay provisions, and have prices tied to an industry index. A modest percentage of fixed-price gas is not unreasonable. Contracts, whether of gas purchases or pipeline capacity, should be intermediate term. Staggering contract expirations (preferably annually) provides an opportunity to be an active market player. A modest degree of reliance on spot purchases provides flexibility, as does the use of market-based storage. Gas storage and on-property gas resources such as liquefied natural gas or propane air are effective peak-day and peak-season supply management tools.

Since pipeline companies no longer buy and sell natural gas and are just common carriers, connections with varied reserve basins and many wells within those basins are of great importance. Diversity of sources helps offset the risks arising from the natural production declines eventually experienced by all reserve basins and individual wells. Moreover, such diversity can enhance a pipeline's attractiveness as a transporter of natural gas to distributors and end users seeking to buy the most economical gas available for their needs.

#### **Water utilities**

Nearly all water systems throughout the U.S. have ample long-term water supplies. Yet to gain comfort, Standard & Poor's assesses the production capability of treatment plants and the ability to pump water from underground aquifers in relation to the usage demands from consumers.

Having adequate treated water storage facilities has become important in recent years and has helped many systems meet demands during peak summer periods. Of interest is whether the resources are owned by the utility or purchased from other utilities or local authorities. Owning properties with water rights provides more supply security. This is especially so in states like California where water allocations are being reduced, particularly since recent droughts and environmental issues have created alarm. Since the primary cost for water companies is treatment, it makes little difference whether raw water is owned or bought. In fact, compliance with federal and state water regulations is very high, and the overall cost to deliver treated water to consumers remains relatively affordable.

#### **Asset concentration in the electric utility industry**

In the electric industry, Standard & Poor's follows the operations of major generating facilities to assess if they are well managed or troubled. Significant dependence on one generating facility or a large financial investment in a single asset suggests high risk. The size or magnitude of a particular asset relative to total generation, net plant in service, and common equity is evaluated. Where substantial asset concentration exists, the financial profile of a company may experience wide swings depending on the asset's performance. Heavy asset concentration is most prevalent among utilities with costly nuclear units.

#### **Earnings protection**

In this category, pretax cash income coverage of all interest charges is the primary ratio. For this calculation, allowance for funds used during construction (AFUDC) is removed from income and interest expense. AFUDC and other such noncash items do not provide any protection for bondholders. To identify total interest expense, the analyst reclassifies certain operating expenses. The interest component of various off-balance-sheet obligations, such as leases and some purchased-power contracts, is included in interest expense. This provides the most direct indication of a utility's ability to service its debt burden.

While considerable emphasis in assessing credit protection is placed on coverage ratios, this measure does not provide the entire earnings protection picture. Also important are a company's earned returns on both equity and capital, measures that highlight a firm's earnings performance. Consideration is given to the interaction of embedded costs, financial leverage, and pretax return on capital.

#### **Capital structure**

Analyzing debt leverage goes beyond the balance sheet and covers quasi-debt items and elements of hidden financial leverage. Noncapitalized leases (including sale/lease-back obligations), debt guarantees, receivables financing, and purchased-power contracts are all considered debt equivalents and are reflected as debt in calculating capital

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structure ratios. By making debt level adjustments, the analyst can compare the degree of leverage used by each utility company.

Furthermore, assets are examined to identify undervalued or overvalued items. Assets of questionable value are discounted to more accurately evaluate asset protection.

Some firms use short-term debt as a permanent piece of their capital structure. Short-term debt also is considered part of permanent capital when it is used as a bridge to permanent financing. Seasonal, self-liquidating debt is excluded from the permanent debt amount, but this situation is rare—with the exception of certain gas utilities. Given the long life of almost all utility assets, short-term debt may expose these companies to interest-rate volatility, remarketing risk, bank line backup risk, and regulatory exposure that cannot be readily offset. The lower cost of shorter-term obligations (assuming a positively sloped yield curve) is a positive factor that partially mitigates the risk of interest-rate variability. As a rule of thumb, a level of short-term debt that exceeds 10% of total capital is cause for concern.

Similarly, if floating-rate debt and preferred stock constitute over one-third of total debt plus preferred stock, this level is viewed as unusually high and may be cause for concern. It might also indicate that management is aggressive in its financial policies.

A layer of preferred stock in the capital structure is usually viewed as equity—since dividends are discretionary and the subordinated claim on assets provides a cushion for providers of debt capital. A preferred component of up to 10% is typically viewed as a permanent wedge in the capital structure of utilities. However, as rate-of-return regulation is phased out, preferred stock may be viewed by utilities—as many industrial firms would—as a temporary option for companies that are not current taxpayers that do not benefit from the tax deductibility of interest. Even now, floating-rate preferred and money market perpetual preferred are problematic; a rise in the rate due to deteriorating credit quality tends to induce a company to take out such preferred stock with debt. Structures that convey tax deductibility to preferred stock have become very popular and do generally afford such financings with equity treatment.

### ***Cash flow adequacy***

Cash flow adequacy relates to a company's ability to generate funds internally relative to its needs. It is a basic component of credit analysis because it takes cash to pay expenses, fund capital spending, pay dividends, and make interest and principal payments. Since both common and preferred dividend payments are important to maintain capital market access, Standard & Poor's looks at cash flow measures both before and after dividends are paid.

To determine cash flow adequacy, several quantitative relationships are examined. Emphasis is placed on cash flow relative to debt, debt service requirements, and capital spending. Cash flow adequacy is evaluated with respect to a firm's ability to meet all fixed charges, including capacity payments under purchased-power contracts. Despite the conditional nature of some contracts, the purchaser is obligated to pay a minimum capacity charge. The ratio used is funds from operations plus interest and capacity payments divided by interest plus capacity payments.

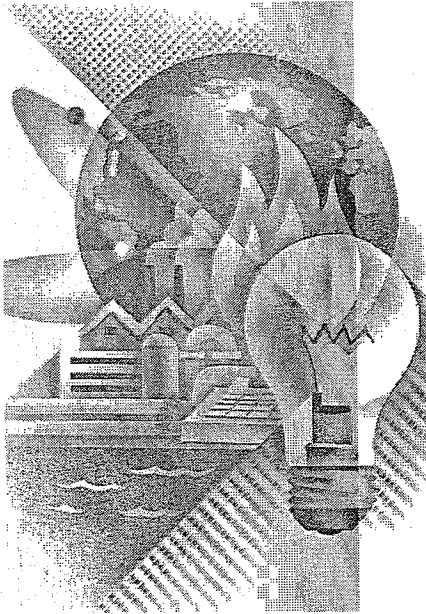
### ***Financial flexibility/capital attraction***

Financing flexibility incorporates a utility's financing needs, plans, and alternatives, as well as its flexibility to accomplish its financing program under stress without damaging creditworthiness. External funding capability complements internal cash flow. Especially since utilities are so capital intensive, a firm's ability to tap capital markets on an ongoing basis must be considered. Debt capacity reflects all the earlier elements: earnings protection, debt leverage, and cash flow adequacy. Market access at reasonable rates is restricted if a reasonable capital structure is not maintained and the company's financial prospects dim. The analyst also reviews indenture restrictions and the impact of additional debt on covenant tests.

Standard & Poor's assesses a company's capacity and willingness to issue common equity. This is affected by various factors, including the market-to-book ratio, dividend policy, and any regulatory restrictions regarding the composition of the capital structure.

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**STANDARD  
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Feature Article

## New Business Profile Scores Assigned for U.S. Utility and Power Companies; Financial Guidelines Revised

Standard & Poor's Ratings Services has assigned new business profile scores to U.S. utility and power companies to better reflect the relative business risk among companies in the sector. Standard & Poor's also has revised its published risk-adjusted financial guidelines. The new business scores and financial guidelines do not represent a change to Standard & Poor's ratings criteria or methodology, and no ratings changes are anticipated from the new business profile scores or revised financial guidelines.

### New Business Profile Scores and Revised Financial Guidelines

Standard & Poor's has always monitored changes in the industry and altered its business risk assessments accordingly. This is the first time since the 10-point business pro-

file scale for U.S. investor-owned utilities was implemented that a comprehensive assessment of the benefits and the application of the methodology has been made. The principal purpose was to determine if the methodology continues to provide meaningful differentiation of business risk. The review indicated that while business profile scoring continues to provide analytical benefits, the complete range of the 10-point scale was not being utilized to the fullest extent.

Standard & Poor's has also revised the key financial guidelines that it uses as an integral part of evaluating the credit quality of U.S. utility and power companies. These guidelines were last updated in June 1999. The financial guidelines for three principal ratios (funds from operations (FFO) interest coverage, FFO to total debt, and total debt to total capital) have been broadened so as to be more flexible. Pretax interest cov-

Chart 1  
Distribution of Business Profile Scores

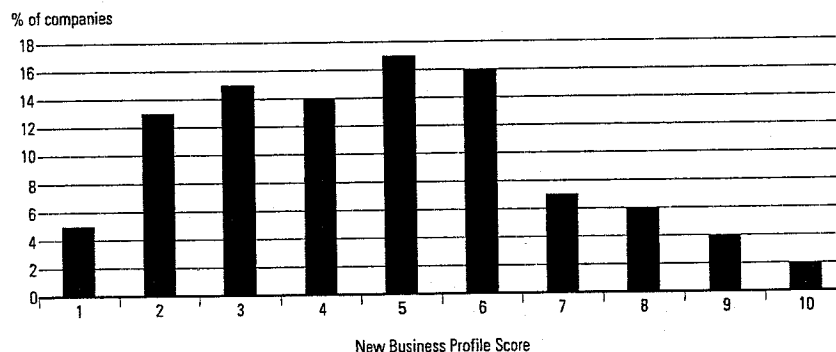
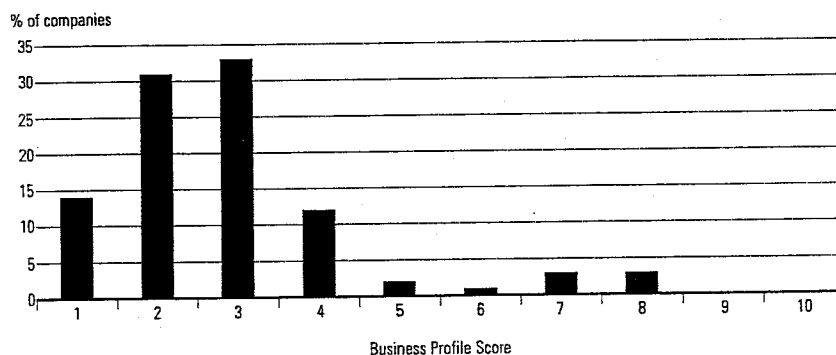


Chart 2  
Transmission and Distribution—Water, Gas, and Electric



## Feature Article

erage as a key credit ratio was eliminated.

Finally, Standard & Poor's has segmented the utility and power industry into sub-sectors based on the dominant corporate strategy that a company is pursuing. Standard & Poor's has published a new U.S. utility and power company ranking list that reflects these sub-sectors.

There are numerous benefits to the reassessment. Fuller utilization of the entire 10-point scale provides a superior relative ranking of qualitative business risk. A revision of the financial guidelines supports the goal of not causing rating changes from the recalibration of the business profiles. Classification of companies by sub-sectors will ensure greater comparability and consistency in ratings. The use of industry segmentation will also allow more in-depth statistical analysis of ratings distributions and rating changes.

The reassessment does not represent a change to Standard & Poor's criteria or methodology for determining ratings for utility and power companies. Each business profile score should be considered as the assignment of a new score; these scores do not represent improvement or deteri-

oration in our assessment of an individual company's business risk relative to the previously assigned score. The financial guidelines continue to be risk-adjusted based on historical utility and industrial medians. Segmentation into industry sub-sectors does not imply that specific company characteristics will not weigh heavily into the assignment of a company's business profile score.

### Results

Previously, 83% of U.S. utility and power business profile scores fell between '3' and '6', which clearly does not reflect the risk differentiation that exists in the utility and power industry today. Since the 10-point scale was introduced, the industry has transformed into a much less homogenous industry, where the divergence of business risk—particularly regarding management, strategy, and degree of competitive market exposure—has created a much wider spectrum of risk profiles. Yet over the same period, business profile scores actually converged more tightly around a median score of '4'. The new business pro-

Chart 3

#### Transmission Only—Electric, Gas, and Other

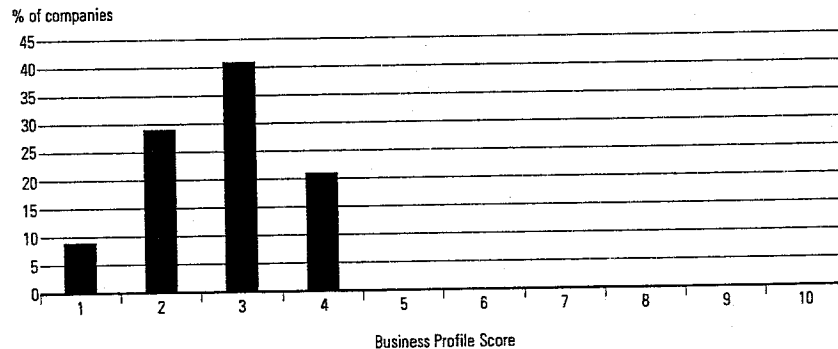
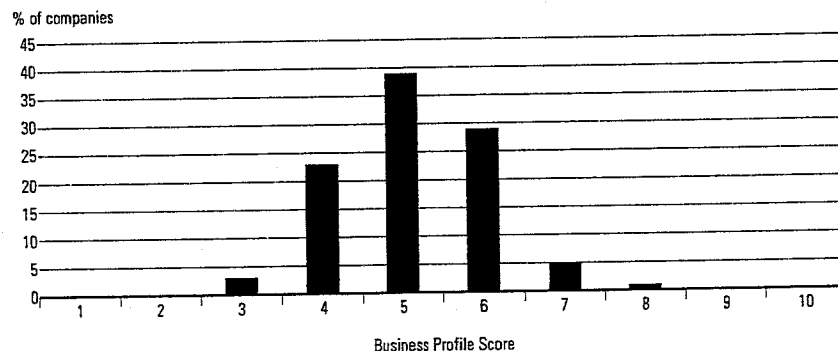


Chart 4

#### Integrated Electric, Gas, and Combination Utilities





## Feature Article

file scores, as of June 2, are shown in Chart 1. The overall median business profile score is now '5'.

Table 1 contains the revised financial guidelines. It is important to emphasize that these metrics are only guidelines associated with expectations for various rating levels. Although credit ratio analysis is an important part of the ratings process, these three statistics are by no means the only critical financial measures that Standard & Poor's uses in its analytical process. We also analyze a wide array of financial ratios that do not have published guidelines for each rating category.

Again, ratings analysis is not driven solely by these financial ratios, nor has it ever been. In fact, the new financial guidelines that Standard & Poor's is incorporating for the specified rating categories reinforce the analytical framework whereby other factors can outweigh the achievement of otherwise acceptable financial ratios. These factors include:

- Effectiveness of liability and liquidity management;
- Analysis of internal funding sources;

- Return on invested capital;
- The execution record of stated business strategies;
- Accuracy of projected performance versus actual results, as well as the trend;
- Assessment of management's financial policies and attitude toward credit; and
- Corporate governance practices.

Charts 2 through 6 show business profile scores broken out by industry sub-sector. The five industry sub-sectors are:

- Transmission and distribution—Water, gas, and electric;
- Transmission only—Electric, gas, and other;
- Integrated electric, gas, and combination utilities;
- Diversified energy and diversified nonenergy; and
- Energy merchant/power developer/trading and marketing companies.

The average business profile scores for transmission and distribution companies and transmission-only companies are lower on the scale than the previous averages, while the average business profile scores for integrated utilities, diversified energy, and energy merchants and developers are higher.

Chart 5  
**Diversified Energy and Diversified Non-Energy**

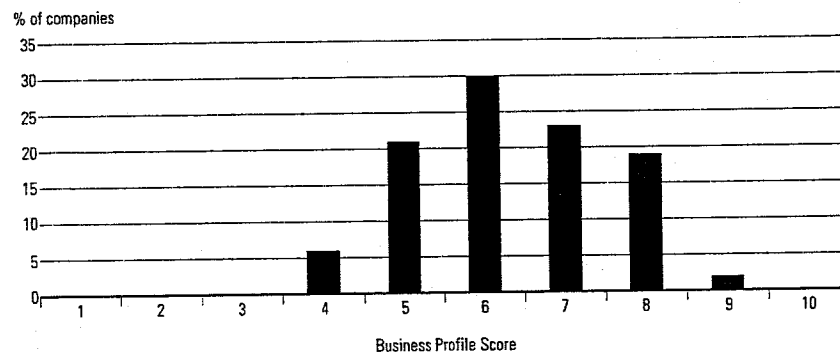
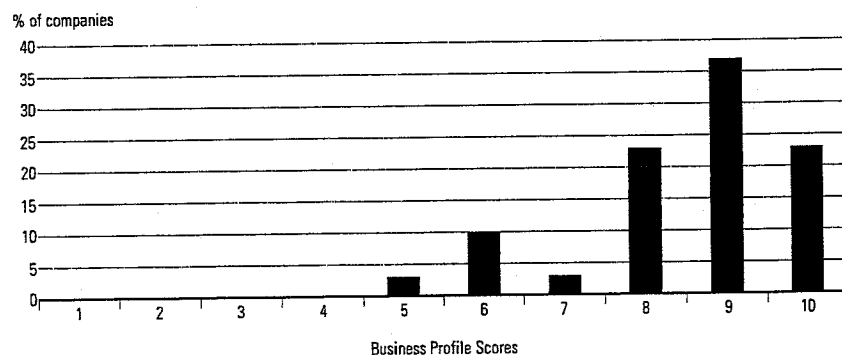


Chart 6  
**Energy Merchant/Developers/Trading and Marketing**



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See pages 16 to 19 for the company ranking list of business profile scores segmented by industry sub-sector and ranked in order of credit rating, outlook, business profile score, and relative strength.

### Business Profile Score Methodology

Standard & Poor's methodology of determining corporate utility business risk is anchored in the assessment of certain specific characteristics that define the sector. We assign business profile scores to each of the rated companies in the utility and power sector on a 10-point scale, where '1' represents the lowest risk and '10' the highest risk. Business pro-

file scores are assigned to all rated utility and power companies, whether they are holding companies, subsidiaries, or stand-alone corporations. For operating subsidiaries and stand-alone companies, the score is a bottom-up assessment. Scores for families of companies are a composite of the operating subsidiaries' scores. The actual credit rating of a company is analyzed, in part, by comparing the business profile score with the risk-adjusted financial guidelines.

For most companies, business profile scores are assessed using five categories; specifically, regulation, markets, operations, competitiveness, and management. The emphasis placed on each category may be influenced by the

Table 1

### Revised Financial Guidelines

#### Funds from operations/interest coverage (x)

Business Profile	AA	A	BBB	BB
1	3	2.5	1.5	1
2	4	3	2	1
3	4.5	3.5	2.5	1.5
4	5	4.2	3.5	2.5
5	5.5	4.5	3.8	2.8
6	6	5.2	4.2	3
7	8	6.5	4.5	3.2
8	10	7.5	5.5	3.5
9		10	7	4
10		11	8	5

#### Funds from operation/total debt (%)

Business Profile	AA	A	BBB	BB
1	20	15	10	5
2	25	20	12	8
3	30	25	15	10
4	35	28	20	12
5	40	30	22	15
6	45	35	28	18
7	55	45	30	20
8	70	55	40	25
9		65	45	30
10		70	55	40

#### Total debt/total capital (%)

Business Profile	AA	A	BBB	BB
1	48	55	60	70
2	45	52	58	68
3	42	50	55	65
4	38	45	52	62
5	35	42	50	60
6	32	40	48	58
7	30	38	45	55
8	25	35	42	52
9		32	40	50
10		25	35	48

## Feature Article

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dominant strategy of the company or other factors. For example, for a regulated transmission and distribution company, regulation may account for 30% to 40% of the business profile score because regulation can be the single-most important credit driver for this type of company. Conversely, competition, which may not exist for a transmission and distribution company, would provide a much lower proportion (e.g., 5% to 15%) of the business profile score.

For certain types of companies, such as power generators, power developers, oil and gas exploration and production companies, or nonenergy-related holdings, where these five components may not be appropriate, Standard & Poor's will use other, more appropriate methodologies. Some of these companies are assigned business profile scores that are useful only for relative ranking purposes.

As noted above, the business profile score for a parent or holding company is a composite of the business profile scores of its individual subsidiary companies. Again, Standard & Poor's does not apply rigid guidelines for deter-

mining the proportion or weighting that each subsidiary represents in the overall business profile score. Instead, it is determined based on a number of factors. Standard & Poor's will analyze each subsidiary's contribution to FFO, forecast capital expenditures, liquidity requirements, and other parameters, including the extent to which one subsidiary has higher growth. The weighting is determined case-by-case. ■

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PROXY GROUP OF SIX AUS UTILITY REPORTS WATER COMPANIES  
CAPITALIZATION AND FINANCIAL STATISTICS (1)  
1999 - 2003, INCLUSIVE

	2003	2002	2001	2000	1999	
	(MILLIONS OF DOLLARS)					
<u>CAPITALIZATION STATISTICS</u>						
<u>AMOUNT OF CAPITAL EMPLOYED</u>						
TOTAL PERMANENT CAPITAL	\$470.63	\$407.79	\$375.00	\$331.41	\$292.07	
SHORT-TERM DEBT	<u>\$32.07</u>	<u>\$35.13</u>	<u>\$30.67</u>	<u>\$26.75</u>	<u>\$24.88</u>	
TOTAL CAPITAL EMPLOYED	<u>\$502.69</u>	<u>\$442.92</u>	<u>\$405.67</u>	<u>\$358.16</u>	<u>\$316.95</u>	
<u>INDICATED AVERAGE CAPITAL COST RATES (2)</u>						
TOTAL DEBT	6.02 %	6.27 %	6.84 %	7.42 %	7.64 %	
PREFERRED STOCK	3.98	5.73	5.31	5.20	5.40	
						5 YEAR AVERAGE
<u>CAPITAL STRUCTURE RATIOS</u>						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	54.07 %	54.19 %	54.26 %	52.09 %	51.27 %	53.18 %
PREFERRED STOCK	0.49	0.57	0.76	0.88	0.98	0.74
COMMON EQUITY	<u>45.44</u>	<u>45.24</u>	<u>44.98</u>	<u>47.03</u>	<u>47.75</u>	<u>46.09</u>
TOTAL	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	57.27 %	57.19 %	57.64 %	54.89 %	54.12 %	56.22 %
PREFERRED STOCK	0.47	0.52	0.70	0.84	0.93	0.69
COMMON EQUITY	<u>42.26</u>	<u>42.29</u>	<u>41.66</u>	<u>44.27</u>	<u>44.95</u>	<u>43.09</u>
TOTAL	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %
<u>FINANCIAL STATISTICS</u>						
<u>FINANCIAL RATIOS - MARKET BASED</u>						
EARNINGS / PRICE RATIO	3.85 %	4.90 %	4.92 %	5.33 %	5.25 %	4.85 %
MARKET / AVERAGE BOOK RATIO	232.50	221.41	215.22	191.35	204.41	212.98
DIVIDEND YIELD	3.28	3.63	3.81	4.26	4.02	3.80
DIVIDEND PAYOUT RATIO	87.80	74.83	79.40	83.28	75.53	80.17
<u>RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY</u>	8.97 %	10.58 %	10.35 %	10.09 %	10.82 %	10.16 %
<u>FUNDS FROM OPERATIONS / INTEREST COVERAGE (3)</u>	3.38 x	3.37 x	3.27 x	3.10 x	3.20 x	3.26 x
<u>FUNDS FROM OPERATIONS / TOTAL DEBT (4)</u>	13.57 %	14.00 %	14.07 %	14.60 %	15.57 %	14.36 %
<u>TOTAL DEBT / TOTAL CAPITAL</u>	57.27 %	57.19 %	57.64 %	54.89 %	54.12 %	56.22 %

See Page 2 for notes.

Proxy Group of Six AUS Utility Reports Water Companies  
Capitalization and Financial Statistics  
1999-2003, Inclusive

Notes:

- (1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.
- (2) Computed by relating actual long-term debt interest or preferred stock dividends booked to average of beginning and ending long-term debt or preferred stock reported to be outstanding.
- (3) Funds from operations (sum of net income, depreciation, amortization, net deferred income tax and investment tax credits, less total AFUDC) plus interest charges divided by interest charges.
- (4) Funds from operations (as defined in Note 3) as a percentage of total debt.

Selection Criteria:

The basis of selection was to include those water companies: 1) which are included in the Water Company Group of C. A. Turner Public Utility Reports (March 2005); 2) which have Value Line (Standard Edition) five-year EPS growth rate projections or Thomson FN / First Call consensus five-year EPS growth rate projections; and 3) which have more than 70% of their 2003 operating revenues derived from water operations.

The following six water companies met the above criteria:

American States Water Co.  
Aqua America, Inc.  
Artesian Resources, Inc.  
California Water Service Group  
Middlesex Water Company  
York Water Co.

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus / Research  
Insight Database  
Company Annual Forms 10K

Capital Structure Based upon Total Capital for  
the Proxy Group of Six AUS Utility Reports Water Companies  
for the Years 1999 through 2003

	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>	<u>1999</u>	<u>5 YEAR AVERAGE</u>
<u>American States Water Co.</u>						
Long-Term Debt	53.41 %	55.89 %	58.74 %	42.50 %	47.98 %	51.70 %
Short-Term Debt	9.72	6.22	3.72	10.80	6.01	7.29
Preferred Stock	0.00	0.00	0.35	0.46	0.56	0.27
Common Equity	<u>36.87</u>	<u>37.89</u>	<u>37.19</u>	<u>46.24</u>	<u>45.45</u>	<u>40.73</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
<u>Aqua America, Inc.</u>						
Long-Term Debt	49.35 %	50.36 %	47.67 %	48.18 %	47.44 %	48.60 %
Short-Term Debt	6.47	9.39	9.83	8.84	11.48	9.20
Preferred Stock	0.06	0.06	0.17	0.46	0.48	0.25
Common Equity	<u>44.12</u>	<u>40.19</u>	<u>42.33</u>	<u>42.52</u>	<u>40.60</u>	<u>41.95</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
<u>Artesian Resources Corp.</u>						
Long-Term Debt	54.83 %	53.82 %	49.44 %	58.71 %	46.49 %	52.66 %
Short-Term Debt	9.39	3.24	16.68	3.65	10.69	8.73
Preferred Stock	0.00	0.17	0.56	0.76	1.00	0.50
Common Equity	<u>35.78</u>	<u>42.77</u>	<u>33.32</u>	<u>36.88</u>	<u>41.82</u>	<u>38.11</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
<u>California Water Services Group</u>						
Long-Term Debt	51.77 %	51.25 %	48.36 %	46.69 %	45.05 %	48.62 %
Short-Term Debt	1.22	7.42	5.11	3.59	3.85	4.24
Preferred Stock	0.66	0.71	0.81	0.85	0.98	0.80
Common Equity	<u>46.35</u>	<u>40.62</u>	<u>45.72</u>	<u>48.87</u>	<u>50.12</u>	<u>46.34</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
<u>Middlesex Water Company</u>						
Long-Term Debt	50.57 %	47.29 %	49.70 %	50.48 %	51.88 %	49.98 %
Short-Term Debt	6.42	9.47	7.43	3.71	1.26	5.66
Preferred Stock	2.09	2.18	2.28	2.49	2.55	2.32
Common Equity	<u>40.92</u>	<u>41.06</u>	<u>40.59</u>	<u>43.32</u>	<u>44.31</u>	<u>42.04</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
<u>York Water Company</u>						
Long-Term Debt	41.40 %	45.00 %	46.35 %	48.29 %	50.41 %	46.29 %
Short-Term Debt	9.07	3.77	2.83	3.90	2.20	4.35
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	<u>49.53</u>	<u>51.23</u>	<u>50.82</u>	<u>47.81</u>	<u>47.39</u>	<u>49.36</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>						
Long-Term Debt	50.22 %	50.60 %	50.04 %	49.14 %	48.21 %	49.64 %
Short-Term Debt	7.05	6.59	7.60	5.75	5.91	6.58
Preferred Stock	0.47	0.52	0.70	0.84	0.93	0.69
Common Equity	<u>42.26</u>	<u>42.29</u>	<u>41.66</u>	<u>44.27</u>	<u>44.95</u>	<u>43.09</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus / Research Insight Data Base  
Company Annual Forms 10K (Sinking Fund Requirements)

PROXY GROUP OF THREE VALUE LINE (STANDARD EDITION) WATER COMPANIES  
CAPITALIZATION AND FINANCIAL STATISTICS (1)  
1999 - 2003, INCLUSIVE

	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>	<u>1999</u>	
	(MILLIONS OF DOLLARS)					
<u>CAPITALIZATION STATISTICS</u>						
<u>AMOUNT OF CAPITAL EMPLOYED</u>						
TOTAL PERMANENT CAPITAL	\$812.16	\$697.46	\$643.70	\$560.38	\$487.73	
SHORT-TERM DEBT	<u>\$52.97</u>	<u>\$62.16</u>	<u>\$50.56</u>	<u>\$49.53</u>	<u>\$45.89</u>	
TOTAL CAPITAL EMPLOYED	<u>\$865.13</u>	<u>\$759.62</u>	<u>\$694.26</u>	<u>\$609.91</u>	<u>\$533.62</u>	
<u>INDICATED AVERAGE CAPITAL COST RATES (2)</u>						
TOTAL DEBT	5.90 %	6.04 %	6.66 %	7.44 %	8.00 %	
PREFERRED STOCK	2.83	3.84	4.03	3.76	3.90	
						<u>5 YEAR AVERAGE</u>
<u>CAPITAL STRUCTURE RATIOS</u>						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	54.78 %	56.84 %	54.95 %	49.65 %	50.50 %	53.34 %
PREFERRED STOCK	0.24	0.28	0.47	0.63	0.72	0.47
COMMON EQUITY	<u>44.98</u>	<u>42.88</u>	<u>44.58</u>	<u>49.72</u>	<u>48.78</u>	<u>46.19</u>
TOTAL	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	57.31 %	60.18 %	57.81 %	53.53 %	53.93 %	56.55 %
PREFERRED STOCK	0.24	0.25	0.44	0.59	0.68	0.44
COMMON EQUITY	<u>42.45</u>	<u>39.57</u>	<u>41.75</u>	<u>45.88</u>	<u>45.39</u>	<u>43.01</u>
TOTAL	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %
<u>FINANCIAL STATISTICS</u>						
<u>FINANCIAL RATIOS - MARKET BASED</u>						
EARNINGS / PRICE RATIO	3.89 %	5.17 %	4.70 %	5.47 %	5.00 %	4.85 %
MARKET / AVERAGE BOOK RATIO	225.26	217.33	225.22	206.93	221.95	219.34
DIVIDEND YIELD	3.32	3.63	3.61	3.77	3.65	3.60
DIVIDEND PAYOUT RATIO	86.86	69.87	78.54	69.17	71.36	75.16
<u>RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY</u>	8.86 %	11.10 %	10.40 %	11.37 %	11.28 %	10.60 %
<u>FUNDS FROM OPERATIONS / INTEREST COVERAGE (3)</u>	3.53 x	3.63 x	3.57 x	3.40 x	3.57 x	3.54 x
<u>FUNDS FROM OPERATIONS / TOTAL DEBT (4)</u>	14.60 %	14.73 %	15.23 %	16.70 %	18.17 %	15.89 %
<u>TOTAL DEBT / TOTAL CAPITAL</u>	57.31 %	60.18 %	57.81 %	53.53 %	53.93 %	56.55 %

See Page 2 for notes.

Proxy Group of Three Value Line (Standard Edition) Water Companies  
Capitalization and Financial Statistics  
1999-2003, Inclusive

Notes:

- (1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.
- (2) Computed by relating actual long-term debt interest or preferred stock dividends booked to average of beginning and ending long-term debt or preferred stock reported to be outstanding.
- (3) Funds from operations (sum of net income, depreciation, amortization, net deferred income tax and investment tax credits, less total AFUDC) plus interest charges divided by interest charges.
- (4) Funds from operations (as defined in Note 3) as a percentage of total debt.

Selection Criteria:

The basis of selection was to include those water companies: 1) which are included in the Value Line (Standard Edition).

The following three water companies met the above criteria:

American States Water Co.  
Aqua America, Inc.  
California Water Service Group

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus / Research  
Insight Database  
Company Annual Forms 10K



Capital Structure Based upon Total Capital for  
the Proxy Group of Three Value Line (Standard Edition) Water Companies  
for the Years 1999 through 2003

	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>	<u>1999</u>	<u>5 YEAR AVERAGE</u>
<u>American States Water Co.</u>						
Long-Term Debt	53.41 %	55.89 %	58.74 %	42.50 %	47.98 %	51.70 %
Short-Term Debt	9.72	6.22	3.72	10.80	6.01	7.29
Preferred Stock	0.00	0.00	0.35	0.46	0.56	0.27
Common Equity	<u>36.87</u>	<u>37.89</u>	<u>37.19</u>	<u>46.24</u>	<u>45.45</u>	<u>40.73</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
<u>Aqua America, Inc.</u>						
Long-Term Debt	49.35 %	50.36 %	47.67 %	48.18 %	47.44 %	48.60 %
Short-Term Debt	6.47	9.39	9.83	8.84	11.48	9.20
Preferred Stock	0.06	0.06	0.17	0.46	0.48	0.25
Common Equity	<u>44.12</u>	<u>40.19</u>	<u>42.33</u>	<u>42.52</u>	<u>40.60</u>	<u>41.95</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
<u>California Water Services Group</u>						
Long-Term Debt	51.77 %	51.25 %	48.36 %	46.69 %	45.05 %	48.62 %
Short-Term Debt	1.22	7.42	5.11	3.59	3.85	4.24
Preferred Stock	0.66	0.71	0.81	0.85	0.98	0.80
Common Equity	<u>46.35</u>	<u>40.62</u>	<u>45.72</u>	<u>48.87</u>	<u>50.12</u>	<u>46.34</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>						
Long-Term Debt	51.51 %	52.50 %	51.59 %	45.79 %	46.82 %	49.64 %
Short-Term Debt	5.80	7.68	6.22	7.74	7.11	6.91
Preferred Stock	0.24	0.25	0.44	0.59	0.68	0.44
Common Equity	<u>42.45</u>	<u>39.57</u>	<u>41.75</u>	<u>45.88</u>	<u>45.39</u>	<u>43.01</u>
Total Capital	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus / Research Insight Data Base  
Company Annual Forms 10K (Sinking Fund Requirements)

Carolina Water Service, Inc.  
Hypothetical Example of the Inadequacy of  
A DCF Return Rate Related to Book Value  
When Market Value is Greater / Less than Book Value

Line No.		<u>1</u>	<u>2</u>	<u>3</u>
		<u>Market Value</u>	<u>Book Value with Market to Book Ratio of 180%</u>	<u>Book Value with Market to Book Ratio of 80%</u>
1.	Per Share	\$ 24.00	\$ 13.33	\$ 30.00
2.	DCF Cost Rate (1)	10.50%	10.50%	10.50%
3.	Return in Dollars	\$ 2.520	\$ 1.400	\$ 3.150
4.	Dividends (2)	\$ 0.840	\$ 0.840	\$ 0.840
5.	Growth in Dollars	\$ 1.680	\$ 0.560	\$ 2.310
6.	Return on Market Value	10.50%	5.83% (3)	13.13% (4)
7.	Rate of Growth on Market Value	7.00% (5)	2.33% (6)	9.63% (7)

- Notes: (1) Comprised of 3.5% dividend yield and 7.0% growth.  
 (2)  $\$24.00 \times 3.5\%$  yield = \$0.840.  
 (3)  $\$1.400 / \$24.00$  market value = 5.83%.  
 (4)  $\$3.150 / \$24.00$  market value = 13.13%.  
 (5) Expected rate of growth per market based DCF model.  
 (6) Actual rate of growth when DCF cost rate is applied to book value (\$1.400 possible earnings - \$0.840 dividends = \$0.560 for growth / \$24.00 market value = 2.33%).  
 (7) Actual rate of growth when DCF cost rate is applied to book value (\$3.150 possible earnings - \$0.840 dividends = \$2.310 for growth / \$24.00 market value = 9.63%).

Carolina Water Service, Inc.  
Indicated Common Equity Cost Rate Through Use of the  
Single Stage Discounted Cash Flow Model for  
the Proxy Group of Six AUS Utility Reports Companies and the  
Proxy Group of Three Value Line (Standard Edition) Water Companies

Based upon Historical and Projected Growth in DPS, EPS, and BR+SV

	1	2	3	4	5
	Average Dividend Yield (1)	Dividend Growth Component (2)	Adjusted Dividend Yield (3)	Growth Rate (4)	Indicated Common Equity Cost Rate (5)
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>					
American States Water Co.	3.5 %	0.1 %	3.6 %	4.7 %	8.3 %
Aqua America, Inc.	2.1	0.1	2.2	10.0	12.2
Artesian Resources Corp.	3.2	0.1	3.3	6.4	9.7
California Water Services Group	3.4	0.1	3.5	5.3	8.8
Middlesex Water Company	3.7	0.1	3.8	3.1	6.9
York Water Company	3.3	0.1	3.4	4.7	8.1
Average	3.2 %	0.1 %	3.3 %	5.7 %	10.2 % (6)
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>					
American States Water Co.	3.5 %	0.1 %	3.6 %	4.7 %	8.3 %
Aqua America, Inc.	2.1	0.1	2.2	10.0	12.2
California Water Services Group	3.4	0.1	3.5	5.3	8.8
Average	3.0 %	0.1 %	3.1 %	6.7 %	10.5 % (6)

Based upon Projected Growth in EPS

	1	2	3	4	5
	Average Dividend Yield (1)	Dividend Growth Component (2)	Adjusted Dividend Yield (3)	Growth Rate (4)	Indicated Common Equity Cost Rate (5)
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>					
American States Water Co.	3.5 %	0.1 %	3.6 %	6.3 %	9.9 %
Aqua America, Inc.	2.1	0.1	2.2	9.4	11.6
Artesian Resources Corp.	3.2	0.1	3.3	9.0	12.3
California Water Services Group	3.4	0.1	3.5	8.3	11.8
Middlesex Water Company	3.7	0.1	3.8	6.0	9.8
York Water Company	3.3	0.1	3.4	7.0	10.4
Average	3.2 %	0.1 %	3.3 %	7.7 %	11.0 % (6)
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>					
American States Water Co.	3.5 %	0.1 %	3.6 %	6.3 %	9.9 %
Aqua America, Inc.	2.1	0.1	2.2	9.4	11.6
California Water Services Group	3.4	0.1	3.5	8.3	11.8
Average	3.0 %	0.1 %	3.1 %	8.0 %	11.1 % (6)

Conclusion

Proxy Group of Six AUS Utility Reports Water Companies 10.6 %

Proxy Group of Three Value Line (Standard Edition) Water Companies 10.8 %

Notes: (1) From Schedule PMA-7.

(2) This reflects a growth rate component equal to one-half the conclusion of growth rate (from page 1 of Schedule PMA-9) x Column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Co.,  $3.5\% \times (1/2 \times 4.7\%) = 0.1\%$ .

(3) Column 1 + Column 2.

(4) From page 1 Schedule PMA-9.

(5) Column 3 + Column 4.

(6) Includes only those indicated common equity cost rates which are greater than 8.6%, i.e., 200 basis points above the prospective yield on A rated Moody's public utility bonds of 6.6% (from page 1 of Schedule PMA-10.)

Carolina Water Service, Inc.  
Derivation of Dividend Yield for Use in the  
Discounted Cash Flow Model

	Dividend Yield		
	Spot (3/28/05) (1)	Average of Last 3 Months (2)	Average Dividend Yield (3)
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>			
American States Water Co.	3.5 %	3.4 %	3.5 %
Aqua America, Inc.	2.1	2.1	2.1
Artesian Resources Corp.	3.3	3.0	3.2
California Water Services Group	3.4	3.3	3.4
Middlesex Water Company	3.7	3.6	3.7
York Water Company	3.3	3.3	3.3
Average	<u>3.2 %</u>	<u>3.1 %</u>	<u>3.2 %</u>
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>			
American States Water Co.	3.5	3.4 %	3.5 %
Aqua America, Inc.	2.1	2.1	2.1
California Water Services Group	3.4	3.3	3.4
Average	<u>3.0 %</u>	<u>2.9 %</u>	<u>3.0 %</u>

- Notes: (1) The spot dividend yield is the current annualized dividend per share divided by the spot market price on 3/28/05.
- (2) The average 3-month dividend yield was computed by relating the indicated annualized dividend rate and market price on the last trading day of each of the three months ended February 28, 2005.
- (3) Equal weight has been given to the 3-month average and spot dividend yield. This provides recognition of current conditions, but does not place undue emphasis thereon.

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus  
Research Insight Database  
finance.yahoo.com

Carolina Water Service, Inc.  
Current Institutional Holdings (1) and Individual Holdings (2) for  
the Proxy Group of Six AUS Utility Reports Water Companies,  
the Proxy Group of Three Value Line (Standard Edition) Water Companies

	<u>1</u>	<u>2</u>
	March 2005 Percentage of Institutional Holdings (1)	March 2005 Percentage of Individual Holdings (2)
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>		
American States Water Co.	35.9 %	64.1 %
Aqua America	29.0	71.0
Artesian Resources Corp.	10.4	89.6
California Water Service Group	24.3	75.7
Middlesex Water Company	17.1	82.9
York Water Company	6.3	93.7
Average	<u>20.5 %</u>	<u>79.5 %</u>
 <u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>		
American States Water Co.	35.9 %	64.1 %
Aqua America	29.0	71.0
California Water Service Group	24.3	75.7
Average	<u>29.7 %</u>	<u>70.3 %</u>

Notes: (1) The percentage of institutional holdings is calculated by dividing the number of shares held by institutions by the number of shares outstanding.

(2) (1 - column 1).

Source of Information: yahoo.investor.reuters.com, Updated March 29, 2005

Carolina Water Service, Inc.  
Historical and Projected Growth

	1	2	3	4	5	6	7	8	9	10	11	12	13	
	Value Line Historical Five Year Growth Rate (1)		Five Year Historical BR + SV (2)	Value Line Projected 2001- 03 to 2007-'09 Growth Rate (1)		ThomsonFN / First Call Mean Consensus Projected Five Year Growth Rate	Average Projected Five Year Growth Rate in EPS (3)	Projected Five Year BR + SV (4)		Range of Growth Rates			Average of all Growth Rates	Average of Midpoint and Average of all Growth Rates (9)
	DPS	EPS		DPS	EPS	EPS				Low	High	Midpoint		
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>														
American States Water Co.	1.0 %	1.5 %	4.4 %	1.5 %	9.5 %	3.0 %	[1]	6.3 %	7.1 %	1.0 %	9.5 %	5.3 %	4.0 %	4.7 %
Aqua America, Inc.	6.0	9.5	15.6	7.0	9.0	9.8	[4]	9.4	7.1	6.0	15.6	10.8	9.1	10.0
Artesian Resources Corp.	4.4 (5)	5.7 (5)	5.4	NA	NA	9.0	[1]	9.0	NA	4.4	9.0	6.7	6.1	6.4
California Water Services Group	1.0	(6.5)	4.9	1.0	10.0	6.5	[4]	8.3	7.2	1.0 (8)	10.0 (8)	5.5	5.1 (8)	5.3 (8)
Middlesex Water Company	2.5	0.5	2.3	NA	NA	6.0	[1]	6.0	NA	0.5	6.0	3.3	2.8	3.1
York Water Company	2.9 (5)	4.2 (5)	3.2	NA	NA	7.0	[1]	7.0	NA	2.9	7.0	5.0	4.3	4.7
Average	3.0 %	4.3 % (8)	6.0 %	3.2 %	9.5 %	6.9 %		7.7 %	7.1 %	2.6 %	9.5 %	6.1 %	5.2 %	5.7 %
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>														
American States Water Co.	1.0 %	1.5 %	4.4 %	1.5 %	9.5 %	3.0 %	[1]	6.3 %	7.1 %	1.0 %	9.5 %	5.3 %	4.0 %	4.7 %
Aqua America, Inc.	6.0	9.5	15.6	7.0	9.0	9.8	[4]	9.4	7.1	6.0	15.6	10.8	9.1	10.0 (8)
California Water Services Group	1.0	(6.5)	4.9	1.0	10.0	6.5	[4]	8.3	7.2	1.0 (8)	10.0 (8)	5.5	5.1 (8)	5.3
Average	2.7 %	5.5 % (8)	8.3 %	3.2 %	9.5 %	6.4 %		8.0 %	7.1 %	2.7 %	11.7 %	7.2 %	6.1 %	6.7 %

- Notes: (1) As shown on pages 8 through 12 of this Schedule. Historical growth rates are five-year compound growth rates.  
(2) From page 2 of this Schedule.  
(3) Average of Columns 5 and 6.  
(4) From page 6 of this Schedule.  
(5) Calculated using the same methodology as Value Line Investment Survey, i.e., three-year base periods ending 2003.  
(6) Average of Columns 1, 2, 3, 4, 5, 6, and 8.  
(7) From Column 7.  
(8) Excludes negatives.  
(9) Average of Column 11 and Column 12.

Source of Information: Value Line Investment Survey, January 28, 2005, Standard Edition and Small- and Mid-Cap Edition  
ThomsonFN First Call Earnings, ec.thomsonfn.com, updated March 26, 2005

Carolina Water Service, Inc.  
Calculation of Historical BR + SV

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
	<u>BR (1)</u>	<u>S Factor (2)</u>	<u>V Factor (3)</u>	<u>SV (4)</u>	<u>BR + SV (5)</u>
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>					
American States Water Co.	3.3 %	2.6 %	43.4 %	1.1 %	4.4 %
Aqua America, Inc.	5.3	15.9	65.0	10.3	15.6
Artesian Resources Corp.	2.2	8.0	40.6	3.2	5.4
California Water Services Group	1.8	6.3	48.8	3.1	4.9
Middlesex Water Company	1.5	1.5	56.4	0.8	2.3
York Water Company	2.0	2.1	55.0	1.2	3.2
Average	<u>2.7 %</u>	<u>6.1 %</u>	<u>51.5 %</u>	<u>3.3 %</u>	<u>6.0 %</u>
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>					
American States Water Co.	3.3 %	2.6 %	43.4 %	1.1 %	4.4 %
Aqua America, Inc.	5.3	15.9	65.0	10.3	15.6
California Water Services Group	1.8	6.3	48.8	3.1	4.9
Average	<u>3.5 %</u>	<u>8.3 %</u>	<u>52.4 %</u>	<u>4.8 %</u>	<u>8.3 %</u>

- Notes: (1) From column 6, page 3 of this Schedule.  
(2) From column 12, page 4 of this Schedule.  
(3) From column 7, page 5 of this Schedule.  
(4) Column 2 \* column 3.  
(5) Column 1 + column 4.

Carolina Water Service, Inc.  
Historical Internal Growth Rate (1), i.e., BR, for  
the Proxy Group of Six AUS Utility Reports Water Companies and the  
Proxy Group of Three Value Line (Standard Edition) Water Companies  
for the Years 1999-2003

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
						Five-Year Average 1999-2003 Internal Growth Rate, i.e., BR
	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>	<u>1999</u>	
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>						
<u>American States Water Co.</u>						
Common Equity Return Rate	5.59 %	9.83 %	10.37 %	10.24 %	10.23 %	
Retention Ratio	(12.98)	35.04	35.65	32.06	28.40	
Internal Growth Rate (1)	(0.73)	3.44	3.70	3.28	2.91	3.3 % (2)
<u>Aqua America, Inc.</u>						
Common Equity Return Rate	12.30 %	13.92 %	13.34 %	13.32 %	12.17 %	
Retention Ratio	43.61	45.22	42.95	42.40	27.15	
Internal Growth Rate (1)	5.36	6.29	5.73	5.65	3.30	5.3
<u>Artesian Resources Corp.</u>						
Common Equity Return Rate	7.41 %	9.67 %	9.80 %	7.39 %	9.74 %	
Retention Ratio	19.24	34.96	31.35	8.12	27.74	
Internal Growth Rate (1)	1.43	3.38	3.07	0.60	2.70	2.2
<u>California Water Services Group</u>						
Common Equity Return Rate	8.68 %	9.56 %	7.49 %	10.54 %	11.43 %	
Retention Ratio	8.79	10.13	(14.22)	18.03	30.37	
Internal Growth Rate (1)	0.76	0.97	(1.07)	1.90	3.47	1.8 (2)
<u>Middlesex Water Company</u>						
Common Equity Return Rate	8.17 %	10.10 %	9.37 %	7.16 %	11.05 %	
Retention Ratio	(6.51)	13.33	5.88	(21.76)	22.73	
Internal Growth Rate (1)	(0.53)	1.35	0.55	(1.56)	2.51	1.5 (2)
<u>York Water Company</u>						
Common Equity Return Rate	11.66 %	10.37 %	11.73 %	11.88 %	10.31 %	
Retention Ratio	21.04	12.32	21.97	21.50	10.46	
Internal Growth Rate (1)	2.45	1.28	2.58	2.55	1.08	2.0
Average						2.7 %
<u>Proxy Group of Three Value Line (Standard Edition) Water</u>						
<u>American States Water Co.</u>						
Common Equity Return Rate	5.59 %	9.83 %	10.37 %	10.24 %	10.23 %	
Retention Ratio	(12.98)	35.04	35.65	32.06	28.40	
Internal Growth Rate (1)	(0.73)	3.44	3.70	3.28	2.91	3.3 % (2)
<u>Aqua America, Inc.</u>						
Common Equity Return Rate	12.30 %	13.92 %	13.34 %	13.32 %	12.17 %	
Retention Ratio	43.61	45.22	42.95	42.40	27.15	
Internal Growth Rate (1)	5.36	6.29	5.73	5.65	3.30	5.3
<u>California Water Services Group</u>						
Common Equity Return Rate	8.68 %	9.56 %	7.49 %	10.54 %	11.43 %	
Retention Ratio	8.79	10.13	(14.22)	18.03	30.37	
Internal Growth Rate (1)	0.76	0.97	(1.07)	1.90	3.47	1.8 (2)
Average						3.5 %

- Notes: (1) The internal growth rate is calculated by multiplying the common equity return rate by the retention ratio (100% minus the dividend payout ratio). All data are on a consolidated basis.
- (2) Excludes negatives.

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus / Research Insight Database



Carolina Water Service, Inc.  
Calculation of Five Year Average Growth in Common Shares Outstanding (1), i.e., S Factor

	1	2	3	4	5	6	7	8	9	10	11	12
	1998 Common Shares Outstanding (1)	97-98 Growth	1999 Common Shares Outstanding (1)	98-99 Growth	2000 Common Shares Outstanding (1)	99-00 Growth	2001 Common Shares Outstanding (1)	00-01 Growth	2002 Common Shares Outstanding (1)	01-02 Growth	2003 Common Shares Outstanding (1)	Five Year Average Common Share Growth
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>												
American States Water Co.	13.437	0.0 %	13.437	12.5 %	15.120	0.0 %	15.120	0.4 %	15.181	0.2 %	15.212	2.6 %
Aqua America, Inc.	54.154	47.9	80.104	4.7	83.869	1.9	85.483	(0.7)	84.896	9.1	92.589	15.9 (2)
Artesian Resources Corp.	2.704	10.8	2.997	0.8	3.020	1.3	3.060	26.2	3.863	1.0	3.901	8.0
California Water Services Group	12.619	2.5	12.936	17.1	15.146	0.2	15.182	0.0	15.182	11.5	16.932	6.3
Middlesex Water Company	9.794	2.1	10.002	1.0	10.098	0.7	10.168	1.8	10.356	2.0	10.567	1.5
York Water Company	5.960	(1.0)	5.902	1.8	6.010	5.0	6.308	0.9	6.365	0.8	6.419	2.1 (2)
Average												6.1 %
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>												
American States Water Co.	13.437	0.0 %	13.437	12.5 %	15.120	0.0 %	15.120	0.4 %	15.181	0.2 %	15.212	2.6 %
Aqua America, Inc.	54.154	47.9	80.104	4.7	83.869	1.9	85.483	(0.7)	84.896	9.1	92.589	15.9 (2)
California Water Services Group	12.619	2.5	12.936	17.1	15.146	0.2	15.182	0.0	15.182	11.5	16.932	6.3
Average												8.3 %

Notes: (1) Year-end shares outstanding.  
(2) Excludes negatives.

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus / Research Insight Database

Carolina Water Service, Inc.  
Calculation of the Premium/Discount of a  
Company's Stock Price Relative to its Book Value, i.e., V Factor

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
	1999	2000	2001	2002	2003	Five Year	V
	Market to Book Ratio (1)	Market to Book Ratio (1)	Market to Book Ratio (1)	Market to Book Ratio (1)	Market to Book Ratio (1)	Average Market to Book Ratio	Factor (2)
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>							
American States Water Co.	177.2 %	170.8 %	174.8 %	180.6 %	180.3 %	176.7 %	43.40 %
Aqua America, Inc.	287.1	252.9	303.5	289.8	295.6	285.8	65.00
Artesian Resources Corp.	168.0	163.3	163.8	162.1	184.5	168.3	40.60
California Water Services Group	201.5	197.1	197.4	181.6	199.8	195.5	48.80
Middlesex Water Company	218.3	209.9	236.9	232.9	247.9	229.2	56.40
York Water Company	174.4	154.2	214.9	281.5	286.9	222.4	55.00
Average						<u>213.0 %</u>	<u>51.50 %</u>
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>							
American States Water Co.	177.2 %	170.8 %	174.8 %	180.6 %	180.3 %	176.7 %	43.40 %
Aqua America, Inc.	287.1	252.9	303.5	289.8	295.6	285.8	65.00
California Water Services Group	201.5	197.1	197.4	181.6	199.8	195.5	48.80
Average						<u>219.3 %</u>	<u>52.40 %</u>

Notes: (1) Market to Book Ratio = average of yearly high-low market price divided by the average of beginning and ending year's balance of book common equity per share.  
(2)  $(1 - (100 / \text{column 6}))$ .

Source of Information: Standard & Poor's Compustat Services, Inc., PC Plus / Research Insight Database

Carolina Water Service, Inc.  
Calculation of Projected BR + SV

	1	2	3	4	5	6	7	8	9	10	11
	Common Shares Outstanding (1) (000,000)				Projected 2007 - 2009 (1)						
	Actual 2003	Projected 2007-2009	S Factor (2)	High Stock Price	Low Stock Price	Book Value	Average Stock Price (3)	V Factor (4)	SV (5)	BR (6)	BR + SV (7)
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>											
American States Water Co.	15.21	19.00	4.6 %	30.00	20.00	17.50	\$25.00	30.0 %	1.4 %	5.7 %	7.1 %
Aqua America, Inc.	92.59	100.00	1.6	35.00	20.00	8.80	27.50	68.0	1.1	6.0	7.1
Artesian Resources Corp.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
California Water Services Group	16.93	23.00	6.3	35.00	25.00	18.25	30.00	39.2	2.5	4.7	7.2
Middlesex Water Company	10.48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
York Water Company	6.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average			<u>4.2 %</u>					<u>45.7 %</u>	<u>1.7 %</u>	<u>5.5 %</u>	<u>7.1 %</u>
<u>Proxy Group of Three Value Line (Standard Edition) Water</u>											
American States Water Co.	15.21	19.00	4.6 %	\$30.00	\$20.00	\$17.50	\$25.00	30.0 %	1.4 %	5.7 %	7.1 %
Aqua America, Inc.	92.59	100.00	1.6	35.00	20.00	8.80	27.50	68.0	1.1	6.0	7.1
California Water Services Group	16.93	23.00	6.3	35.00	25.00	18.25	30.00	39.2	2.5	4.7	7.2
Average			<u>4.2 %</u>					<u>45.7 %</u>	<u>1.7 %</u>	<u>5.5 %</u>	<u>7.1 %</u>

NA = Not Available

- Notes: (1) From pages 8 through 12 of this Schedule.  
(2) The S Factor is the six or five year compound growth rate between the 2003 and 2008 (mid-point of 2007-2009 projection) common shares outstanding.  
(3) The Average Stock Price is the average of column 4 and column 5.  
(4) (1 - (column 6 / column 7)).  
(5) Column 3 \* column 8.  
(6) From page 9, column 14 of this Schedule.  
(7) Column 9 + column 10.

Source of information: Value Line Investment Survey, January 28, 2005, Standard Edition and Small- and Mid-Cap Edition

Carolina Water Service, Inc.  
Projected Internal Growth Rate

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	2003			2007-2009						2007-2009				
	Common Equity (%) (1)	Total Capital (\$ mill) (1)	Common Equity (\$ mill) (2)	Common Equity (%) (1)	Total Capital (\$ mill) (1)	Common Equity (\$ mill) (3)	Annual Common Equity Growth Rate (4)	ROE Adjustment Factor (5)	Return on Common Equity (1)	Return on Average Common Equity (6)	EPS (1)	DPS (1)	Retention Ratio (7)	Projected Internal Growth (8)
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>														
American States Water Co.	48.00 %	\$442.30	\$212.30	48.00 %	\$700.00	\$336.00	8.82 %	1.05 %	10.50 %	11.03 %	\$2.00	\$0.96	52.0 %	5.7 %
Aqua America, Inc.	48.60	1,355.70	658.87	48.00	1,380.00	634.80	-0.74	1.00	13.00	13.00	1.20	0.65	45.8	6.0
Artesian Resources Corp.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
California Water Services Group	47.00	520.30	244.54	50.00	840.00	420.00	11.42	1.05	11.00	11.55	2.00	1.18	41.0	4.7
Middlesex Water Company	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
York Water Company	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average														5.5 %
<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>														
American States Water Co.	48.00 %	\$442.30	\$212.30	48.00 %	\$700.00	\$336.00	8.82 %	1.05 %	10.50 %	11.03 %	\$2.00	\$0.96	52.0 %	5.7 %
Aqua America, Inc.	48.60	1,355.70	658.87	48.60	1,380.00	670.68	0.36	1.00	13.00	13.00	1.20	0.65	45.8	6.0
California Water Services Group	47.00	520.30	244.54	47.00	840.00	394.80	10.05	1.05	11.00	11.55	2.00	1.18	41.0	4.7
Average														5.5 %

NA = Not Available

- Notes: (1) From pages 8 through 12 of this Schedule.  
(2) Column 1 \* column 2.  
(3) Column 4 \* column 5.  
(4) Five year compound growth rate in common equity from 2003 to 2007-2009 or (((column 6 / column 3) \* (1/5)) - 1)).  
(5)  $2 * ((1 + \text{column } 7) / (2 + \text{column } 7))$ .  
(6) Column 8 \* column 9.  
(7)  $1 - (\text{column } 12 / \text{column } 11)$ .  
(8) Column 10 \* column 13.

Source of Information: Value Line Investment Survey, January 28, 2005, Standard Edition and Small- and Mid-Cap Edition

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AQUA AMERICA NYSE-WTR										RECENT PRICE	24.25	P/E RATIO	26.6	Trailing: 29.9 Median: 20.0	RELATIVE P/E RATIO	1.41	DIV YLD	2.1%	VALUE LINE
<b>TIMELINESS</b> 4	Lowered 8/10/04	High: 5.3	5.0	5.5	7.6	11.4	15.4	15.4	16.0	19.7	20.0	22.4	24.6	24.6	24.6	24.6	24.6	24.6	24.6
<b>SAFETY</b> 3	Lowered 8/10/03	Low: 4.0	4.4	4.4	5.2	5.9	9.7	10.1	8.4	12.5	12.8	15.8	18.9	18.9	18.9	18.9	18.9	18.9	18.9
<b>TECHNICAL</b> 2	Raised 1/7/05	LEGENDS 1.50% Dividends p.sh. divided by Interest Rate ..... Relative Price Strength 3-for-2 split 7/96 4-for-3 split 1/98 5-for-4 split 12/00 5-for-4 split 12/01 5-for-4 split 12/03 Options: Yes Shaded area indicates recession										Target Price Range 2007 2008 2009							
<b>BETA</b> .75	(1.00 = Market)	2007-09 PROJECTIONS										64 48 40 32 24 20 16 12 8 6							
		Price	Gain	Ann'l Total	Return														
High	35	(+45%)	11%																
Low	20	(-20%)	-2%																
<b>Insider Decisions</b>																			
	M A M J J A S O N																		
to Buy	1 0 0 1 0 0 0 0 0 0																		
Options	0 0 1 0 0 0 0 1 0																		
to Sell	0 0 2 1 0 1 0 0 0																		
<b>Institutional Decisions</b>																			
	10/20/04	2/20/04	3/20/04																
to Buy	93	90	90																
to Sell	73	62	45																
Holds	26637	26345	26282																
	Percent	4.5																	
	shares	3																	
	traded	1.5																	
<b>MARKET CAP: \$2.3 billion (Mid Cap)</b>																			
<b>CAPITAL STRUCTURE as of 9/30/04</b>																			
Total Debt \$961.5 mill Due In 5 Yrs \$211.9 mill																			
LT Debt \$772.5 mill LT Interest \$45.0 mill																			
(Total interest coverage: 3.5x)																			
<b>Pension Assets-12/03 \$108.7 mill</b>																			
Oblig. \$150.1 mill																			
<b>Pfd Stock None</b>																			
<b>Common Stock 83,254,277 shares as of 10/25/04</b>																			
<b>ANNUAL RATES</b>																			
	Past	Past	Est'd																
of change (per sh)	10 Yrs.	5 Yrs.	to '07-'09																
Revenues	4.0%	7.5%	8.0%																
"Cash Flow"	8.5%	10.5%	7.0%																
Earnings	8.5%	9.5%	9.0%																
Dividends	5.0%	6.0%	7.0%																
Book Value	8.0%	9.5%	6.0%																
<b>QUARTERLY REVENUES (\$ mill)</b>																			
Cal-	Mar.31	Jun.30	Sep.30	Dec.31															
endar																			
2001	70.2	77.3	84.7	75.1															
2002	71.7	76.6	91.9	81.8															
2003	80.5	83.4	102.1	101.2															
2004	99.8	106.5	120.3	113.4															
2005	110	120	130	130															
<b>EARNINGS PER SHARE</b>																			
Cal-	Mar.31	Jun.30	Sep.30	Dec.31															
endar																			
2001	.14	.18	.22	.14															
2002	.14	.16	.25	.17															
2003	.15	.18	.24	.19															
2004	.17	.19	.26	.23															
2005	.19	.23	.27	.26															
<b>QUARTERLY DIVIDENDS PAID</b>																			
Cal-	Mar.31	Jun.30	Sep.30	Dec.31															
endar																			
2001	.099	.099	.099	.106															
2002	.106	.106	.106	.112															
2003	.112	.112	.112	.12															
2004	.12	.12	.12	.13															
2005	.13																		

(A) Primary shares outstanding through '96; diluted thereafter. Excl. nonrec. gains (losses): '90, (38¢); '91, (34¢); '92, (38¢); '99, (11¢); '00, 2¢; '01, 2¢; '02, 5¢; '03, 4¢. Excl. gain from

disc operations: '96, 2¢. Next earnings report due early February. (B) Dividends historically paid in early March, June, Sept. & Dec. Div. reinvestment plan available (5% discount).

(C) In millions, adjusted for stock splits.

Company's Financial Strength B+  
Stock's Price Stability 85  
Price Growth Persistence 95  
Earnings Predictability 100

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**BUSINESS:** Aqua America, Inc. is the holding company for water and wastewater utilities that serve approximately 2.5 million residents in Pennsylvania, Ohio, New Jersey, Illinois, Maine, North Carolina, Texas, Florida, Kentucky, and five other states. Divested three of four non-water businesses in '91; telemarketing group in '93; and others. Acquired Consumers Water, 4/99; AquaSource, 7/03; and others. Water supply revenues '03: residential, 59%; commercial, 17%; industrial & other, 24%. Officers and directors own 1.4% of the common stock (4/04 Proxy). Chairman & Chief Executive Officer: Nicholas DeBenedictis. Incorporated: Pennsylvania. Address: 762 West Lancaster Avenue, Bryn Mawr, Pennsylvania 19010. Telephone: 610-625-1400. Internet: www.aquaamerica.com.

**We look for Aqua America to post an earnings gain of 12% in 2005, following last year's likely advance of almost 12%. The revenue increase was primarily a result of acquisitions. Heavier-than-usual rainfall in 2004's final quarter likely dampened earnings by as much as \$0.03.**

**Aqua America completed 29 acquisitions in 2004. These purchases were primarily funded with long- and short-term debt. Unsecured notes were the company's preferred way of securing capital, and the year-end close of the ratio of long-term debt to total capital was probably 54%. The interest rate on most of the company's current long-term debt is in the range of 5% to 6.5%. The first addition of 2005 was a water system in Texas at a cost of about \$325,000. Aqua sees its southern markets as an appealing expansion avenue.**

**The company has been relatively successful in achieving rate increases, within this heavily regulated industry. Most recently, Aqua won a 5% rate hike in Pennsylvania. This is equivalent to \$13.8 million in annual revenues. The company is also on the verge of a rate hike in Texas, which should be finalized in May. If so,**

this would raise revenues by about \$12 million per annum. Utility commissions are more apt to award increases due to rising capital costs rather than operating expenses. In Aqua's case, rate increases have also been influenced by the it's ability to lower the ratio of expenses to revenues.

**This untimely stock's price-to-earnings ratio is somewhat above its traditional norm. Consequently, despite decent earnings growth prospects, this equity's appreciation potential to 2007-2009 is unattractive. The percentage of dividends to net profit has been generally trending down since 1994, and we don't expect this to be reversed in the coming years. The increase in retained earnings, combined with the likelihood of a rising debt level, accounts for our projection that earnings growth in the coming 3 to 5 years will exceed the 8.5% average increase (per Annual Rate box) over the past 10 years. The company's top rank for Earnings Predictability, along with high marks for the Stock's Price Stability and Growth Persistence, may well appeal to conservative investors.**

Marc Denton

January 28, 2005

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Carolina Water Service, Inc.  
Indicated Common Equity Cost Rate  
Through Use of a Risk Premium Model  
Using an Adjusted Total Market Approach

Line No.		<u>Proxy Group of Six AUS Utility Reports Water</u>	<u>Proxy Group of Three Value Line (Standard Edition) Water Companies</u>
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	6.2 %	6.2 %
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A Rated Public Utility Bonds	<u>0.4 (2)</u>	<u>0.4 (2)</u>
3.	Adjusted Prospective Yield on A Rated Public Utility Bonds	6.6 %	6.6 %
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	<u>0.0 (4)</u>	<u>0.0 (4)</u>
5.	Adjusted Prospective Bond Yield	6.6	6.6
6.	Equity Risk Premium (5)	<u>4.0</u>	<u>4.2</u>
7.	Risk Premium Derived Common Equity Cost Rate	<u>10.6 %</u>	<u>10.8 %</u>

- Notes:
- (1) Derived in Note (3) on page 6 of this Schedule.
  - (2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.43%, rounded to 0.4% from page 4 of this Schedule.
  - (3) Assumed.
  - (4) No adjustment necessary as the average Moody's bond rating of the proxy group is A2.
  - (5) From page 5 of this Schedule.

Carolina Water Service, Inc.  
Comparison of Bond Ratings and Business Profile for  
the Proxy Group of Six AUS Utility Reports Water Companies and  
the Proxy Group of Three Value Line (Standard Edition) Water Companies

	March 2005		March 2005				Standard & Poor's
	Moody's		Standard & Poor's				Business Position
	Bond Rating		Bond Rating				/ Profile (2)
	Bond Rating	Numerical Weighting (1)	Bond Rating	Numerical Weighting (1)	Credit Rating	Numerical Weighting (1)	
Proxy Group of Six AUS Utility Reports Water Companies							
American States Water Co. (3)	A2	6	A-	7	A-	7	3
Aqua America, Inc. (4)	NR	--	AA-	4	A+	5	2
Artesian Resources, Inc	NR	--	NR	--	NR	--	--
California Water Service Group (5)	A2	6	NR	--	A+	5	3
Middlesex Water Company	NR	--	A+	5	A	6	3
York Water Company	NR	--	NR	--	A-	5	2
Average	A2	6.0	A+	5.3	A	5.6	2.6
Proxy Group of Three Value Line (Standard Edition) Water							
American States Water Co. (3)	A2	6	A-	7	A-	7	3.0
Aqua America, Inc. (4)	NR	--	AA-	4	A+	5	2.0
California Water Service Group (5)	A2	6	NR	--	A+	5	3.0
Average	A2	6.0	A+ / A	5.5	A	5.7	2.7

- Notes: (1) From page 3 of this Schedule.  
(2) From Standard & Poor's U.S. Utilities and Power Ranking List, March 24, 2005.  
(3) Ratings and business profile are those of Southern California Water Company  
(4) Ratings and business profile are those of Aqua Pennsylvania, Inc.  
(5) Ratings and business profile are those of California Water Service Company.

Source of Information: Moody's Investors Service  
Standard & Poor's Global Utilities Rating Service

Carolina Water Service, Inc.  
Numerical Assignment for  
Moody's and Standard & Poor's Bond Ratings

<u>Moody's Bond Rating</u>	<u>Numerical Bond Weighting</u>	<u>Standard &amp; Poor's Bond Rating</u>
Aaa	1	AAA
Aa1	2	AA+
Aa2	3	AA
Aa3	4	AA-
A1	5	A+
A2	6	A
A3	7	A-
Baa1	8	BBB+
Baa2	9	BBB
Baa3	10	BBB-
Ba1	11	BB+
Ba2	12	BB
Ba3	13	BB-

Moody's  
Comparison of Interest Rate Trends  
for the Three Months Ending February 2005 (1)

Years	Corporate Bonds	Public Utility Bonds			Spread - Corporate v. Public Utility Bonds			Spread - Public Utility Bonds	
	Aaa Rated	Aa Rated	A Rated	Baa Rated	Aa (Pub. Util.) over Aaa (Corp.)	A (Pub. Util.) over Aaa (Corp.)	Baa (Pub. Util.) over Aaa (Corp.)	A over Aa	Baa over A
December-04	5.47 %	5.78 %	5.92 %	6.10 %					
January-05	5.36	5.68	5.78	5.95					
February-05	5.20	5.55	5.61	5.76					
Average of Last 3 Months	<u>5.34 %</u>	<u>5.67 %</u>	<u>5.77 %</u>	<u>5.94 %</u>	<u>0.33 %</u>	<u>0.43 %</u>	<u>0.60 %</u>	<u>0.10 %</u>	<u>0.17 %</u>

Notes: (1) All yields are distributed yields.

Source of Information: Mergent Bond Record , March 2005, Vol. 72, No. 3

Carolina Water Service, Inc.  
Judgment of Equity Risk Premium for  
the Proxy Group of Six AUS Utility Reports Water Companies and  
the Proxy Group of Three Value Line (Standard Edition) Water Companies

Line No.		Proxy Group of Six AUS Utility Reports Water Companies	Proxy Group of Three Value Line (Standard Edition) Water Companies
1.	Calculated equity risk premium based on the total market using the beta approach (1)	3.8 %	4.1 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A rated bonds (2)	<u>4.2</u>	<u>4.2</u>
3.	Average equity risk premium	<u><u>4.0 %</u></u>	<u><u>4.2 %</u></u>

Notes: (1) From page 6 of this Schedule.  
(2) From page 8 of this Schedule.

Carolina Water Service, Inc.  
Derivation of Equity Risk Premium Based on the Total Market Approach  
Using the Beta for  
the Proxy Group of Six AUS Utility Reports Water Companies and  
the Proxy Group of Three Value Line (Standard Edition) Water Companies

Line No.		Proxy Group of Six AUS Utility Reports Water	Proxy Group of Three Value Line (Standard Edition) Water Companies
1.	Arithmetic mean total return rate on the Standard & Poor's 500 Composite Index - 1926-2004 (1)	12.4 %	12.4 %
2.	Arithmetic mean yield on Aaa and Aa Corporate Bonds 1926-2004 (2)	<u>(6.1)</u>	<u>(6.1)</u>
3.	Historical Equity Risk Premium	<u>6.3 %</u>	<u>6.3 %</u>
4.	Forecasted 3-5 year Total Annual Market Return (3)	11.0 %	11.0 %
5.	Prospective Yield an Aaa Rated Corporate Bonds (4)	<u>(6.2)</u>	<u>(6.2)</u>
6.	Forecasted Equity Risk Premium	<u>4.8 %</u>	<u>4.8 %</u>
7.	Average of Historical and Forecasted Equity Risk Premium (5)	5.6 %	5.6 %
8.	Adjusted Value Line Beta (6)	<u>0.68</u>	<u>0.73</u>
9.	Beta Adjusted Equity Risk Premium	<u>3.8 %</u>	<u>4.1 %</u>

- Notes: (1) From Stocks, Bonds, Bills and Inflation - 2005 Yearbook Valuation Edition, Ibbotson Associates, Inc., Chicago, IL, 2005.
- (2) From Moody's Industrial Manual and Mergent Bond Record Monthly Update.
- (3) From page 3 of Schedule PMA-11.
- (4) Average forecast based upon six quarterly estimates of Aaa rated corporate bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated April 1, 2005 (see page 7 of this Schedule). The estimates are detailed below.

Second Quarter 2005	5.7 %
Third Quarter 2005	6.0
Fourth Quarter 2005	6.2
First Quarter 2006	6.3
Second Quarter 2006	6.4
Third Quarter 2006	<u>6.5</u>
Average	<u>6.2 %</u>

- (5) Average of the Historical Equity Risk Premium of 6.3% from Line No. 3 and the Forecasted Equity Risk Premium of 4.8% from Line No. 6 ((6.3% + 4.8%) / 2 = 5.55%, rounded to 5.5%).
- (6) From page 9 of this Schedule.

2 ■ BLUE CHIP FINANCIAL FORECASTS ■ APRIL 1, 2005

## Consensus Forecasts Of U.S. Interest Rates And Key Assumptions<sup>1</sup>

Interest Rates	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			Latest Q*	2Q	3Q	4Q	1Q	2Q	3Q
	Mar.18	Mar.11	Mar.4	Feb.25	Feb.	Jan.	Dec.		2005	2005	2005	2006	2006	2006
Federal Funds Rate	2.55	2.50	2.51	2.52	2.50	2.28	2.16	2.43	3.0	3.4	3.7	3.9	4.1	4.2
Prime Rate	5.50	5.50	5.50	5.50	5.49	5.25	5.14	5.41	6.0	6.4	6.7	6.9	7.1	7.2
LIBOR, 3-mo.	3.03	2.98	2.94	2.88	2.82	2.67	2.50	2.82	3.2	3.6	4.0	4.2	4.3	4.4
Commercial Paper, 1-mo.	2.68	2.61	2.58	2.50	2.49	2.33	2.22	2.48	3.0	3.5	3.8	4.0	4.2	4.3
Treasury bill, 3-mo.	2.80	2.76	2.75	2.69	2.58	2.37	2.22	2.57	3.0	3.4	3.7	3.9	4.1	4.2
Treasury bill, 6-mo.	3.10	3.04	3.00	2.94	2.85	2.68	2.50	2.86	3.3	3.6	3.9	4.1	4.3	4.4
Treasury bill, 1 yr.	3.31	3.24	3.20	3.13	3.03	2.86	2.67	3.05	3.5	3.8	4.1	4.3	4.4	4.5
Treasury note, 2 yr.	3.73	3.66	3.58	3.50	3.38	3.22	3.01	3.42	3.8	4.1	4.4	4.5	4.7	4.8
Treasury note, 5 yr.	4.18	4.11	4.00	3.89	3.77	3.71	3.60	3.86	4.3	4.5	4.7	4.9	5.0	5.1
Treasury note, 10 yr.	4.51	4.45	4.37	4.28	4.17	4.22	4.23	4.28	4.6	4.9	5.0	5.2	5.3	5.3
Treasury note, 20 yr.	4.91	4.84	4.79	4.74	4.61	4.77	4.88	4.74	5.1	5.3	5.5	5.6	5.7	5.7
Corporate Aaa bond	5.40	5.35	5.34	5.30	5.20	5.36	5.47	5.31	5.7	6.0	6.2	6.3	6.4	6.5
Corporate Baa bond	6.05	5.97	5.95	5.91	5.82	6.02	6.15	5.94	6.4	6.7	6.9	7.0	7.2	7.2
State & Local bonds	4.56	4.57	4.50	4.42	4.35	4.41	4.48	4.43	4.7	4.9	5.0	5.2	5.3	5.3
Home mortgage rate	5.95	5.85	5.79	5.69	5.63	5.71	5.75	5.73	6.1	6.3	6.5	6.7	6.8	6.8

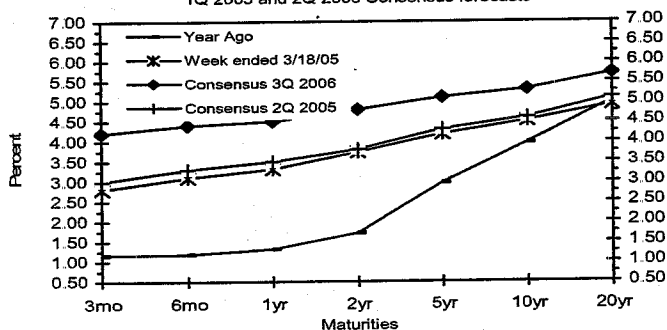
  

Key Assumptions	History								Consensus Forecasts-Quarterly Avg.					
	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q*	2Q	3Q	4Q	1Q	2Q	3Q
	2003	2003	2003	2004	2004	2004	2004	2005	2005	2005	2005	2006	2006	2006
Major Currency Index	90.8	90.7	87.8	85.3	88.0	86.5	81.9	81.1	80.0	79.4	79.0	79.1	79.1	79.3
Real GDP	4.1	7.4	4.2	4.5	3.3	4.0	3.8	3.9	3.7	3.6	3.5	3.4	3.4	3.5
GDP Price Index	1.1	1.4	1.6	2.8	3.2	1.4	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.2
Consumer Price Index	0.7	2.4	0.7	3.5	4.8	1.9	3.4	2.4	2.6	2.4	2.5	2.5	2.5	2.5

<sup>1</sup>Individual panel members' forecasts are on pages 4 through 9. Historical data for interest rates except LIBOR is from Federal Reserve Release (FRSR) H 15. LIBOR quotes available from *The Wall Street Journal*. Definitions reported here are same as those in FRSR H 15. Treasury yields are reported on a constant maturity basis. Historical data for the U.S. Federal Reserve Board's Major Currency Index is from FRSR H 10 and G 5. Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS). \*Interest rate data for 1Q 2005 based on historical data through the week ended March 18. Data for 1Q 2005 Major Currency Index also is based on data through week ended March 18. Figures shown for 1Q 2005 Real GDP, GDP Chained Price Index and Consumer Price Index are consensus forecasts based on a special question survey this month of the panel members.

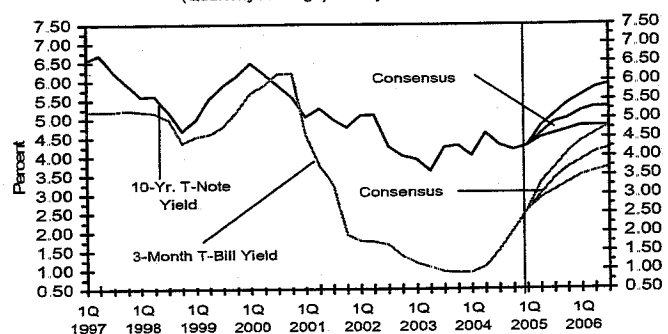
### U.S. Treasury Yield Curve

Week ended March 18, 2005 and Year Ago vs.  
1Q 2005 and 2Q 2006 Consensus forecasts



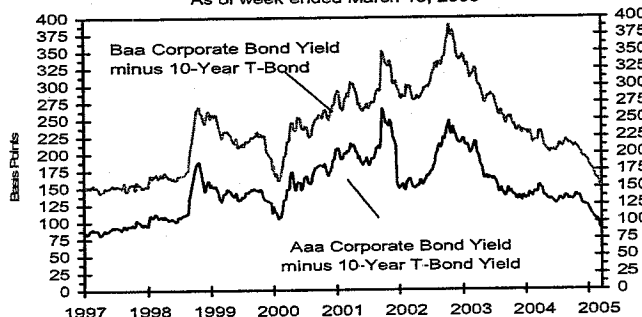
### U.S. 3-Mo. T-Bills & 10-Yr. T-Note Yield

(Quarterly Average) History Forecast



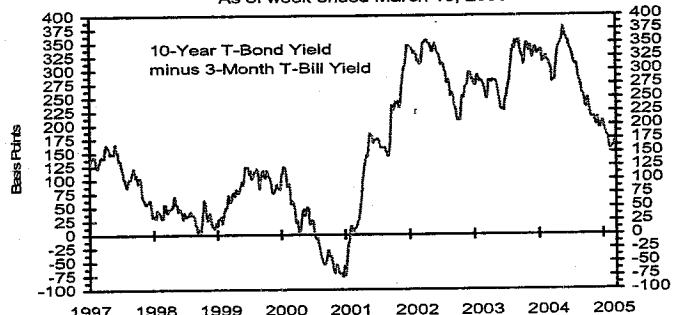
### Corporate Bond Spreads

As of week ended March 18, 2005



### U.S. Treasury Yield Curve

As of week ended March 18, 2005





Carolina Water Service, Inc.  
Derivation of Mean Equity Risk Premium Based on a Study  
Using Holding Period Returns of Public Utilities

Line No.	Over A Rated Public Utility Bonds AUS Consultants - Utility Services Study (1)
	<u>1</u>
Time Period	1928-2003
1. Arithmetic Mean Holding Period Returns (2): Standard & Poor's Public Utility Index	10.8 %
2. Arithmetic Mean Yield on: A Rated Public Utility Bonds	<u>(6.6)</u>
3. Equity Risk Premium	<u><u>4.2 %</u></u>

- Notes: (1) S&P Public Utility Index and Moody's Public Utility Bond Average Annual Yields 1928-2003, (US Consultants - Utility Services, 2004).
- (2) Holding period returns are calculated based upon income received (dividends and interest) plus the relative change in the market value of a security over a one-year holding period.

Carolina Water Service, Inc.  
Value Line Adjusted Betas for  
the Proxy Group of Six AUS Utility Reports Water Companies and  
the Proxy Group of Three Value Line (Standard Edition) Water Companies

	Value Line Adjusted Beta
<u>Proxy Group of Six AUS Utility Reports Water Companies</u>	
American States Water Co.	0.70
Aqua America, Inc.	0.75
Artesian Resources Corp.	NA
California Water Service Group	0.75
Middlesex Water Company	0.65
York Water Company	0.55
Average	<u>0.68</u>
 <u>Proxy Group of Three Value Line (Standard Edition) Water</u>	
American States Water Co.	0.70
Aqua America, Inc.	0.75
California Water Service Group	0.75
Average	<u>0.73</u>

NA = Not Available

Source of Information: Value Line Investment Survey, January 28, 2005  
Standard Edition and Small and Mid-Cap Edition

Carolina Water Service, Inc.  
of the Capital Asset Pricing Model for  
the Proxy Group of Six AUS Utility Reports Water Companies,  
the Proxy Group of Three Value Line (Standard Edition) Water Companies and the

Line No.		Proxy Group of Six AUS Utility Reports Water Companies	Proxy Group of Three Value Line (Standard Edition) Water Companies
<u>Traditional Capital Asset Pricing Model</u>			
1.	Risk-Free Rate (1)	5.5 %	5.5 %
2.	Average Company-Specific Market Premium (2)	<u>4.4</u>	<u>4.7</u>
3.	Capital Asset Pricing Model Derived Company Equity Cost Rate	<u>9.9 %</u>	<u>10.2 %</u>
<u>Empirical Capital Asset Pricing Model</u>			
4.	Risk-Free Rate (1)	5.5 %	5.5 %
5.	Average Company-Specific Market Premium (2)	<u>4.9</u>	<u>5.1</u>
6.	Capital Asset Pricing Model Derived Company Equity Cost Rate	<u>10.4 %</u>	<u>10.6 %</u>
7.	Conclusion	<u>10.2 %</u>	<u>10.4 %</u>

Notes: (1) Developed in note 2 of page 3 of this Schedule.  
(2) Developed on page 2 of this Schedule.

Carolina Water Service, Inc.  
Indicated Common Equity Cost Rate Through Use  
of the Capital Asset Pricing Model

Value Line Adjusted Beta	Company-Specific Risk Premium Based on Market Premium of 6.4% (1)	CAPM Result Including Risk-Free Rate of 5.5% (2)
--------------------------------	--	---

Traditional Capital Asset Pricing Model (3)

Proxy Group of Six AUS Utility  
Reports Water Companies

American States Water Co.	0.70	4.5 %	10.0 %
Aqua America, Inc.	0.75	4.8	10.3
Artesian Resources Corp.	NA	NA	NA
California Water Service Group	0.75	4.8	10.3
Middlesex Water Company	0.65	4.2	9.7
York Water Company	0.55	3.5	9.0
Average	0.68	4.4 %	9.9 % (4)

Proxy Group of Three Value Line  
(Standard Edition) Water Companies

American States Water Co.	0.70	4.5 %	10.0 %
Aqua America, Inc.	0.75	4.8	10.3
California Water Service Group	0.75	4.8	10.3
Average	0.73	4.7 %	10.2 % (4)

Empirical Capital Asset Pricing Model (5)

Proxy Group of Six AUS Utility  
Reports Water Companies

American States Water Co.	0.70	5.0 %	10.5 %
Aqua America, Inc.	0.75	5.2	10.7
Artesian Resources Corp.	NA	NA	NA
California Water Service Group	0.75	5.2	10.7
Middlesex Water Company	0.65	4.7	10.2
York Water Company	0.55	4.2	9.7
Average	0.68	4.9 %	10.4 % (4)

Proxy Group of Three Value Line  
(Standard Edition) Water Companies

American States Water Co.	0.70	5.0 %	10.5 %
Aqua America, Inc.	0.75	5.2	10.7
California Water Service Group	0.75	5.2	10.7
Average	0.73	5.1 %	10.6 % (4)

See page 3 for notes.

Carolina Water Service, Inc.  
Development of the Market-Required Rate of Return on Common Equity Using  
the Capital Asset Pricing Model for  
the Proxy Group of Six AUS Utility Reports Water Companies, and the  
Proxy Group of Three Value Line (Standard Edition) Water Companies  
Adjusted to Reflect a Forecasted Risk-Free Rate and Market Return

Notes:

- (1) From the three previous month-end (Jan. '05 – Mar. '05), as well as a recently available (Mar. 25, 2005), Value Line Summary & Index, a forecasted 3-5 year total annual market return of 11.0% can be derived by averaging the 3-month and spot forecasted total 3-5 year total appreciation, converting it into an annual market appreciation and adding the Value Line average forecasted annual dividend yield.

The 3-5 year average total market appreciation of 43% produces a four-year average annual return of 9.35%  $((1.43^{25}) - 1)$ . When the average annual forecasted dividend yield of 1.60% is added, a total average market return of 10.95%, rounded to 11.0%,  $(1.60\% + 9.35\%)$  is derived.

The 3-month and spot forecasted total market return of 11.0% minus the risk-free rate of 5.5% (developed in Note 2) is 5.5%  $(11.0\% - 5.5\%)$ . The Ibbotson Associates calculated market premium of 7.2% for the period 1926-2004 results from a total market return of 12.4% less the average income return on long-term U.S. Government Securities of 5.2%  $(12.4\% - 5.2\% = 7.2\%)$ . This is then averaged with the 5.5% Value Line market premium resulting in a 6.35%, rounded to 6.4%, market premium. The 6.4% market premium is then multiplied by the beta in column 1 of page 2 of this Schedule.

- (2) Average forecast based upon six quarterly estimates of 20-year Treasury Bond yields per the consensus of nearly 50 economists reported in the Blue Chip Financial Forecasts dated March 1, 2005 (see page 7 of Schedule PMA-10). The estimates are detailed below:

	<u>20-Year Treasury Bond Yield</u>
Second Quarter 2005	5.1%
Third Quarter 2005	5.3
Fourth Quarter 2005	5.5
First Quarter 2006	5.6
Second Quarter 2006	5.7
Third Quarter 2006	5.7
Average	<u>5.5%</u>

- (3) The traditional Capital Asset Pricing Model (CAPM) is applied using the following formula:

$$R_S = R_F + \beta (R_M - R_F)$$

Where  $R_S$  = Return rate of common stock  
 $R_F$  = Risk Free Rate  
 $\beta$  = Value Line Adjusted Beta  
 $R_M$  = Return on the market as a whole

- (4) Includes only those indicated common equity cost rates which are above 8.6%, i.e., 200 basis points above the prospective yield of 6.6% on A rated Moody's public utility bonds (from page 1 of Schedule PMA-10).

- (5) The empirical CAPM is applied using the following formula:

$$R_S = R_F + .25 (R_M - R_F) + .75 \beta (R_M - R_F)$$

Where  $R_S$  = Return rate of common stock  
 $R_F$  = Risk-Free Rate  
 $\beta$  = Value Line Adjusted Beta  
 $R_M$  = Return on the market as a whole

Source of Information: Value Line Summary & Index  
Blue Chip Financial Forecasts, April 1, 2005  
Value Line Investment Survey, January 28, 2005 Standard Edition and Small and Mid-Cap Edition  
Stocks, Bonds, Bills and Inflation – Valuation Edition 2005 Yearbook,  
Ibbotson Associates, Inc., Chicago, IL, 2005

Carolina Water Service, Inc.  
Comparable Earnings Analysis  
for a Proxy Group of Ninety-One Non-Utility Companies Comparable to  
the Proxy Group of Six AUS Utility Reports Water Companies (1)

Proxy Group of Ninety-One Non-Utility Companies Comparable to the Proxy Group of Five AUS Utility Reports Water Companies (1)	Adj. Beta	Unadj. Beta	Standard Error of the Regression	Standard Deviation of Beta	Rate of Return on Net Worth										5-year Average (2)		5-Year Projected (3)			
					1999	2000	2001	2002	2003	Percent	Student's T-Test	Percent	Student's T-Test							
21st Century Ins. Group	0.90	0.79	0.4119	4.0793	12.1	%	1.8	%	3.7	%	7.4	%	8.5	%	6.7	%	(1.11)	12.5	%	(0.55)
ABM Industries Inc.	0.75	0.60	0.3561	3.8737	13.7		12.5		12.1		8.2		9.5		11.2		(0.74)	14.0		(0.41)
Abbott Labs.	0.80	0.64	0.3797	3.6596	34.7		32.5		32.5		30.4		26.6		31.3		0.81	27.5		0.82
Alliant Techsystems	0.70	0.50	0.2832	4.0134	56.1		34.2		15.5		27.0		28.8		32.3		0.99	15.5		(0.27)
Allied Capital Corp.	0.85	0.75	0.4401	3.5729	14.6		13.8		14.8		14.7		10.0		13.6		(0.54)	15.0		(0.32)
AmerisourceBergen	0.75	0.59	0.3265	4.0313	50.0		35.1		4.9		10.8		11.2		22.4		0.18	10.0		(0.77)
Annaly Mortgage Mgmt.	0.85	0.47	0.2956	3.5381	17.6		12.2		13.8		20.3		15.7		15.9		(0.35)	14.0		(0.41)
Archer Daniels Mid'd	0.70	0.53	0.3344	3.4824	4.5		4.9		6.1		6.8		6.2		5.7		(1.19)	10.0		(0.77)
Arrow Int'l	0.60	0.35	0.2321	3.4776	15.8		17.0		14.3		13.1		13.3		14.7		(0.45)	15.0		(0.32)
Bard (C.R.)	0.75	0.56	0.3426	3.5753	20.5		20.4		18.2		20.1		19.5		19.7		(0.04)	23.0		0.41
Barnes Group	0.80	0.69	0.4058	3.8463	15.8		17.7		9.6		13.0		10.3		13.3		(0.57)	13.5		(0.45)
Beckman Coulter	0.80	0.32	0.1863	3.9372	46.5		36.5		27.3		26.9		20.3		31.5		0.93	13.5		(0.45)
Becton Dickinson	0.75	0.60	0.3677	3.5550	21.8		20.1		18.8		19.3		19.6		19.9		(0.02)	20.0		0.14
Berry Petroleum 'A'	0.75	0.55	0.3187	3.8971	15.5		25.6		14.3		17.5		17.5		18.1		(0.17)	16.5		(0.18)
Blyth Inc.	0.80	0.65	0.3854	3.9088	24.3		23.0		16.5		16.9		17.0		19.5		(0.06)	14.0		(0.41)
Bob Evans Farms	0.80	0.69	0.4167	3.5112	12.3		11.1		12.5		13.4		11.4		12.1		(0.66)	11.0		(0.68)
C.H. Robinson	0.85	0.72	0.3879	3.9979	21.6		24.0		23.6		22.6		22.1		22.8		0.21	21.5		0.27
CLARCOR Inc.	0.85	0.72	0.4486	3.3580	16.8		16.8		15.3		14.8		14.7		15.6		(0.38)	13.5		(0.45)
Casey's Gen'l Stores	0.85	0.76	0.4047	4.0351	12.8		10.3		8.8		9.8		8.3		10.0		(0.84)	13.5		(0.45)
Church & Dwight	0.50	0.22	0.1313	3.9436	18.6		20.9		19.1		19.4		17.9		19.2		(0.08)	14.5		(0.36)
Clorox Co.	0.65	0.41	0.2372	3.9350	24.9		23.4		20.2		23.8		42.3		0.55			93.5 (4)		6.82
Coca-Cola	0.80	0.35	0.2301	3.4979	34.0		39.4		35.0		34.7		34.0		36.4		1.25	33.5		1.36
Coca-Cola Bottling	0.55	0.25	0.1472	3.8658	14.7		9.5		38.5		69.0		58.5		38.0		1.46	41.0 (4)		2.05
ConAgra Foods	0.70	0.47	0.3242	3.2512	23.9		27.0		17.1		18.2		18.2		20.9		0.06	18.0		(0.05)
Constellation Brands	0.70	0.51	0.2791	4.0924	15.5		15.8		14.4		16.4		11.2		14.7		(0.45)	12.5		(0.55)
Corn Products Int'l	0.80	0.67	0.4110	3.5055	7.5		6.4		6.7		7.8		8.3		7.3		(1.06)	11.0		(0.68)
Curtiss-Wright	0.70	0.49	0.3048	3.8307	12.3		13.1		11.6		10.1		10.9		11.6		(0.70)	12.0		(0.59)
Dean Foods	0.65	0.43	0.2663	3.6241	20.5		20.1		8.5		17.0		12.6		15.7		(0.37)	10.5		(0.73)
Dentsply Int'l	0.75	0.56	0.3780	3.2454	19.2		19.4		18.0		17.5		15.4		17.9		(0.19)	12.5		(0.55)
Dionex Corp.	0.85	0.76	0.4474	3.5554	34.7		28.7		24.5		21.0		19.7		26.7		0.45	23.0		0.41
ESCO Technologies	0.80	0.67	0.3729	3.8928	3.5		5.4		6.1		7.1		12.0		6.8		(1.10)	12.5		(0.55)
Fannie Mae	0.85	0.77	0.4535	3.5528	22.2		21.3		29.6		38.6		31.7		28.7		0.70	23.0		0.41
Fortune Brands	0.80	0.69	0.4287	3.4311	12.4		17.1		17.8		21.2		20.9		17.9		(0.19)	16.0		(0.23)
Franklin Electric	0.70	0.48	0.2766	3.8388	27.8		20.9		22.0		21.0		17.9		21.9		0.14	17.5		(0.09)
Gen'l Dynamics	0.80	0.68	0.3932	3.6309	22.5		23.6		20.8		20.2		16.7		20.8		0.05	15.0		(0.32)
Gillette	0.65	0.42	0.2591	3.6925	41.2		65.0		48.9		53.5		61.8		54.1 (4)		2.78	38.5 (4)		1.82
Golden West Fin'l	0.85	0.72	0.4375	3.4819	13.0		10.7		11.8		16.1		18.8		14.0		(0.51)	17.5		(0.09)
HON Industries Inc.	0.85	0.74	0.4678	3.2703	19.8		18.5		15.2		14.1		13.8		16.3		(0.32)	18.0		(0.05)
Harland (John H.)	0.75	0.55	0.3082	3.9987	25.3		16.7		19.3		22.4		22.0		21.1		0.07	15.5		(0.27)
Int'l Flavors & Frag.	0.75	0.55	0.3341	3.6591	22.0		23.7		25.8		32.0		26.9		28.1		0.48	18.5		-
Invacare Corp.	0.85	0.71	0.4289	3.4983	15.1		15.8		13.5		11.6		10.0		13.2		(0.57)	12.0		(0.59)
Kellogg	0.55	0.31	0.2109	3.3497	74.5		72.6		61.1		79.4		54.5		68.4 (4)		3.95	27.5		0.82
Lancaster Colony	0.80	0.63	0.3951	3.4623	22.9		24.6		19.6		16.6		16.1		20.0		(0.02)	15.5		(0.27)
Lance Inc.	0.75	0.56	0.3274	3.7982	13.7		12.6		13.4		11.0		13.1		12.8		(0.61)	15.5		(0.27)
Lawson Products	0.70	0.48	0.2955	3.6597	15.9		16.3		8.7		7.7		9.7		11.7		(0.70)	14.5		(0.36)
Lincoln Elec Hldgs.	0.85	0.75	0.4083	3.9591	20.7		19.3		16.8		17.2		11.7		17.1		(0.25)	16.0		(0.23)
Lockheed Martin	0.65	0.44	0.2687	3.7286	9.0		6.0		10.8		18.0		15.6		20.0		0.02	20.0		0.23
Marathon Oil Corp.	0.85	0.76	0.4784	3.2788	9.0		27.0		26.7		11.1		16.7		18.1		(0.17)	12.5		(0.55)
Mattel Inc.	0.75	0.58	0.3217	4.0079	9.3		20.9		20.5		24.6		24.9		20.7		(0.02)	15.0		(0.32)
Matthews Int'l	0.85	0.45	0.2868	3.5042	21.8		22.0		21.0		21.1		17.5		20.0		0.04	20.0		0.14
Medtronic Inc.	0.85	0.74	0.4403	3.5380	24.7		23.4		23.0		21.8		22.0		23.0		0.23	20.0		(0.82)
Murphy Oil Corp.	0.85	0.75	0.4124	3.8141	9.4		24.3		17.6		6.4		13.1		14.2		(0.49)	9.5		(0.82)
Newell Rubbermaid	0.85	0.74	0.4033	3.9824	17.2		18.5		13.1		20.5		20.2		17.9		(0.19)	22.0		0.32
Northrop Grumman	0.65	0.39	0.2410	3.7158	14.8		15.9		5.5		4.8		4.8		9.2		(0.80)	10.0		(0.77)
Occidental Petroleum	0.85	0.76	0.4826	3.2566	7.3		27.8		23.6		16.2		20.3		19.0		(0.10)	15.5		(0.27)

Carolina Water Service, Inc.  
Comparable Earnings Analysis  
for a Proxy Group of Ninety-One Non-Utility Companies Comparable to  
the Proxy Group of Six AUS Utility Reports Water Companies (1)

Proxy Group of Ninety-One Non-Utility Companies Comparable to the Proxy Group of Five AUS Utility Reports Water Companies (1)	Adj. Beta	Unadj. Beta	Standard Error of the Regression	Standard Deviation of Beta	Rate of Return on Net Worth					5-year Average (2)		5-Year Projected (3)	
					1999	2000	2001	2002	2003	Percent	Student's T-Test	Percent	Student's T-Test
Pactiv Corp.	0.85	0.76	0.4316	3.7478	7.1	9.3	9.8	24.5	21.7	14.5	(0.47)	17.0	(0.14)
Papa John's Int'l	0.75	0.55	0.3153	3.8794	17.4	28.5	24.2	38.4	23.0	26.3	0.50	17.0	(0.14)
People's Bank	0.85	0.71	0.0837	3.1527	42.7	41.8	46.4	50.8	56.5	47.6 (4)	2.25	52.0 (4)	3.05
PepsiAmericas Inc.	0.75	0.59	0.3614	3.5677	6.2	5.8	8.3	9.4	8.8	7.5	(1.04)	10.5	(0.73)
Pfizer Inc.	0.80	0.67	0.0840	3.1614	38.2	40.4	45.6	47.9	19.5	38.3	1.48	22.0	0.32
Procter & Gamble	0.55	0.26	0.1484	4.0024	34.4	34.4	36.6	38.9	35.4	35.5	1.25	27.5	0.82
Quaker Chemical	0.80	0.67	0.3751	3.8905	19.0	20.2	16.8	16.2	13.2	17.1	(0.25)	9.5	(0.82)
Ralcorp Holdings	0.55	0.31	0.2162	3.3069	11.2	10.8	9.9	12.3	13.0	11.4	(0.72)	12.0	(0.59)
Renal Care Group	0.60	0.38	0.2279	3.7875	16.8	15.9	15.0	17.0	18.5	16.6	(0.30)	19.5	0.09
Republic Services	0.70	0.54	0.3023	3.9962	13.8	13.4	12.1	12.6	11.3	12.8	(0.62)	14.5	(0.36)
Ruddick Corp.	0.85	0.75	0.4335	3.6577	11.4	10.8	10.8	12.3	12.1	11.5	(0.71)	13.0	(0.50)
Ryan's Family	0.80	0.65	0.3520	4.0653	14.7	14.9	14.2	15.7	14.0	14.7	(0.45)	11.0	(0.68)
SLM Corporation	0.75	0.59	0.3760	3.3902	47.9	34.8	37.3	31.9	33.3	37.0	1.38	26.5	0.73
Sara Lee Corp.	0.60	0.37	0.2584	3.2494	88.3	92.0	99.9	63.8	59.1	80.8 (4)	4.95	32.5	1.27
Selective Ins. Group	0.85	0.73	0.4223	3.6580	9.4	4.6	4.5	6.1	7.7	6.5	(1.12)	12.5	(0.55)
Sensient Techn.	0.80	0.64	0.3888	3.5476	18.6	16.7	15.1	16.2	13.4	16.0	(0.34)	12.0	(0.59)
ServiceMaster Co.	0.75	0.59	0.3543	3.6403	18.6	15.9	9.4	14.0	19.4	15.5	(0.39)	19.5	0.09
Sigma-Aldrich	0.80	0.68	0.4221	3.4485	11.8	10.2	17.4	14.8	19.3	15.9	(0.35)	14.5	(0.36)
Smucker (J.M.)	0.65	0.40	0.2445	3.6918	11.4	13.4	12.2	9.3	10.0	11.3	(0.73)	10.0	(0.77)
Sonic Corp.	0.70	0.54	0.3002	4.0245	18.3	21.0	19.4	20.7	19.7	19.8	(0.03)	15.0	(0.32)
St. Jude Medical	0.85	0.75	0.3986	4.0631	18.1	16.6	17.2	17.5	21.2	18.1	(0.17)	17.0	(0.14)
Standex Int'l	0.80	0.69	0.4117	3.6094	18.9	18.5	14.5	11.4	11.1	14.9	(0.43)	18.5	-
Stryker Corp.	0.70	0.53	0.3281	3.6128	23.9	25.9	25.7	23.8	21.0	24.1	0.32	26.5	0.73
Sysco Corp.	0.80	0.65	0.4066	3.4073	25.4	25.8	27.8	31.9	35.4	29.3	0.75	28.5	0.91
Tecumseh Products 'A'	0.80	0.68	0.3874	3.7838	13.1	6.6	4.4	5.5	3.8	6.7	(1.11)	10.0	(0.77)
Tennant Co.	0.80	0.67	0.4003	3.5757	17.7	16.2	3.1	8.0	8.5	11.1	(0.76)	12.0	(0.59)
Thomas Inds.	0.75	0.59	0.3475	3.7628	12.5	13.5	11.9	10.4	9.4	11.5	(0.71)	6.5	(1.08)
Thornburg Mtg.	0.70	0.53	0.3317	3.5147	8.2	9.2	11.0	14.4	14.2	11.4	(0.72)	14.0	(0.41)
UnitedHealth Group	0.65	0.44	0.2565	3.9340	14.6	19.1	23.5	30.5	35.6	24.7	0.37	30.0	1.05
Universal Corp.	0.70	0.47	0.3156	3.3252	23.6	23.7	21.4	18.1	18.3	21.0	0.07	17.0	(0.14)
Varian Medical Sys.	0.80	0.68	0.3743	3.9647	4.5	19.6	17.2	19.8	23.2	16.9	(0.27)	34.0	1.41
WD-40 Co.	0.75	0.58	0.3145	4.1031	39.3	38.9	30.6	30.5	27.9	33.4	1.08	22.0	0.32
Wal-Mart Stores	0.85	0.77	0.0849	3.1983	22.1	20.1	19.1	20.4	20.3	20.4	0.02	25.5	0.64
Walgreen Co.	0.80	0.65	0.3950	3.5554	17.9	17.9	18.7	18.3	16.1	17.0	(0.26)	17.0	(0.14)
Wendy's Int'l	0.75	0.58	0.3153	3.9640	15.6	16.1	18.8	15.1	13.4	15.8	(0.36)	14.5	(0.36)
West Pharm. Svcs.	0.70	0.51	0.3165	3.6171	15.7	8.3	11.8	6.4	10.6	10.8	(0.79)	12.5	(0.55)
Average for the Non-Utility Group	0.75	0.58	0.3349	3.6715									

Average for the Proxy Group of Six AUS  
Utility Reports Water Companies

Mean

Conclusion (6)

Conservative Mean (7)

Conservative Conclusion (8)

See pages 5 and 6 for notes.

18.2%	17.1%
17.7% (8)	
14.9%	14.0%
14.5% (8)	

Carolina Water Service, Inc.  
Comparable Earnings Analysis  
for a Proxy Group of Ninety Non-Utility Companies Comparable to  
the Proxy Group of Three Value Line (Standard Edition) Water Companies (9)

Proxy Group of Ninety Non-Utility Companies Comparable to the Proxy Group of Three Value Line (Standard Edition) Water Companies (9)	Adj. Beta	Unadj. Beta	Standard Error of the Regression	Standard Deviation of Beta	Rate of Return on Net Worth										5-year Average (2)		5-Year Projected (3)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Proxy Group of Ninety Non-Utility Companies Comparable to the Proxy Group of Three Value Line (Standard Edition) Water Companies (8)	Adj. Beta	Unadj. Beta	Standard Error of the Regression	Standard Deviation of Beta	Rate of Return on Net Worth									
					for a Proxy Group of Ninety Non-Utility Companies Comparable to the Proxy Group of Three Value Line (Standard Edition) Water Companies (8)					5-Year Average (2)				
					1999	2000	2001	2002	2003	Percent	Student's T-Test	Percent	Student's T-Test	5-Year Projected (3)
Papa John's Int'l	0.75	0.56	0.3153	3.8784	17.4	28.5	24.2	38.4	23.0	26.3	0.59	17.0	0.07	(0.07)
People's Bank	0.85	0.71	0.4657	3.1527	14.3	12.3	2.8	5.9	6.4	8.3	(0.89)	10.5	(0.69)	(0.69)
PepsiAmericas Inc.	0.75	0.59	0.3614	3.5677	6.2	5.8	6.3	9.4	9.8	7.5	(0.95)	10.5	(0.85)	(0.85)
Pfizer Inc.	0.80	0.67	0.4460	3.1614	38.2	40.4	45.6	47.9	19.5	36.3	1.57	22.0	0.41	0.41
Pliny Boves	0.80	0.83	0.5140	3.2447	38.7	48.8	62.4	67.0	52.3	53.8	(4)	34.5	1.62	1.62
Protective Life	0.90	0.78	0.4842	3.3266	17.7	12.3	10.1	10.0	9.8	12.0	(0.58)	11.0	(0.84)	(0.84)
Quaker Chemical	0.80	0.67	0.3751	3.8905	19.0	20.2	16.8	16.2	13.2	17.1	(0.16)	9.5	(0.78)	(0.78)
RLI Corp.	0.75	0.58	0.3938	3.0733	10.7	8.8	9.0	8.4	10.6	9.5	(0.79)	11.5	(0.60)	(0.60)
Ralcorp Holdings	0.55	0.31	0.2162	3.3068	11.2	10.8	9.9	12.3	13.0	11.4	(0.63)	12.0	(0.55)	(0.55)
Reinsurance Group	0.80	0.81	0.4942	3.7543	7.2	12.3	4.0	10.5	8.5	8.5	(0.87)	11.0	(0.64)	(0.64)
Renal Care Group	0.60	0.38	0.2279	3.7875	16.8	15.9	15.0	17.0	18.5	16.8	(0.20)	18.5	0.17	0.17
Reynolds & Reynolds	0.80	0.80	0.4289	3.6253	26.8	22.5	20.9	25.4	20.0	24.3	0.43	23.5	0.58	0.58
Ruddick Corp.	0.85	0.75	0.4335	3.6577	11.4	10.8	10.8	12.3	12.1	11.5	(0.82)	13.0	(0.45)	(0.45)
SJM Corporation	0.75	0.59	0.3760	3.3902	47.9	34.8	37.3	31.8	33.3	37.0	1.47	28.5	0.85	0.85
Sara Lee Corp.	0.60	0.37	0.2584	3.2484	88.3	92.0	98.9	63.8	59.1	80.8	(4)	32.5	1.42	1.42
Selective Ins. Group	0.85	0.73	0.4223	3.6580	9.4	4.6	4.5	8.1	7.7	6.5	(1.03)	12.5	(0.50)	(0.50)
Sensient Techn.	0.80	0.64	0.3888	3.5476	18.8	16.7	15.1	16.2	13.4	16.0	(0.25)	12.0	(0.55)	(0.55)
ServiceMaster Co.	0.75	0.59	0.3543	3.6403	18.6	15.9	8.4	14.0	18.4	15.5	(0.30)	18.5	0.17	0.17
Sigma-Aldrich	0.80	0.68	0.4221	3.4486	11.8	16.2	17.4	14.8	19.3	15.9	(0.26)	14.5	(0.31)	(0.31)
Smucker (J.M.)	0.65	0.40	0.2445	3.6918	11.4	13.4	12.2	9.3	10.0	11.3	(0.64)	10.0	(0.74)	(0.74)
Standex Int'l	0.80	0.69	0.4117	3.8094	18.9	18.5	14.5	11.4	11.1	14.9	(0.34)	18.5	0.08	0.08
Stryker Corp.	0.70	0.53	0.3281	3.8128	23.9	25.9	25.7	23.8	21.0	24.1	0.41	28.5	0.85	0.85
Sysco Corp.	0.80	0.65	0.4066	3.4073	25.4	25.8	27.8	31.9	35.4	28.3	0.84	28.5	1.04	1.04
Tecumseh Products A'	0.80	0.68	0.3874	3.7838	13.1	6.8	4.4	5.5	3.8	6.7	(1.02)	10.0	(0.74)	(0.74)
Tennant Co.	0.80	0.67	0.4003	3.5767	17.7	18.2	3.1	8.0	8.5	11.1	(0.69)	12.0	(0.55)	(0.55)
Thomas Inds.	0.75	0.59	0.3475	3.7626	12.5	13.5	11.9	10.4	9.4	11.5	(0.62)	12.0	(0.55)	(0.55)
Thomburg Mfg.	0.70	0.53	0.3317	3.5147	8.2	9.2	11.0	14.4	14.2	11.4	(0.63)	6.5	(1.08)	(1.08)
Toro Co.	0.85	0.75	0.4912	3.1416	12.5	14.3	14.8	17.4	18.5	15.5	(0.30)	27.0	0.89	0.89
UnitedHealth Group	0.65	0.44	0.2565	3.8340	14.6	18.1	23.5	30.5	35.6	24.7	0.46	30.0	1.18	1.18
Universal Corp.	0.70	0.47	0.3156	3.3252	23.6	23.7	21.4	18.1	18.3	21.0	0.16	17.0	(0.07)	(0.07)
Unocal Corp.	0.80	0.78	0.4964	3.1910	5.2	26.8	19.2	10.0	16.0	15.4	(0.30)	16.0	(0.16)	(0.16)
Valpar Corp.	0.90	0.82	0.4995	3.3492	20.9	19.8	11.3	16.3	12.9	16.2	(0.24)	12.5	(0.50)	(0.50)
Wal-Mart Stores	0.85	0.77	0.4908	3.1983	22.1	20.1	18.1	20.4	20.3	20.4	0.11	25.5	0.75	0.75
Walgreen Co.	0.80	0.65	0.3850	3.5554	17.9	17.9	16.7	16.3	16.1	17.0	(0.17)	17.0	(0.07)	(0.07)
West Pharm. Svcs.	0.70	0.51	0.3165	3.6171	15.7	8.3	11.8	6.4	10.6	10.6	(0.70)	12.5	(0.50)	(0.50)
Average for the Non-Utility Group	0.77	0.62	0.3789	3.5381										

Average for the Proxy Group of Three Value Line (Standard Edition) Water Companies (8)

17.0%

16.8% (8)

16.6%

14.7%

14.4% (8)

14.0%

Mean

Conclusion (6)

Conservative Mean (7)

Conservative Conclusion (8)

See pages 6 and 7 for notes.

Carolina Water Service, Inc.  
Comparable Earnings Analysis

- Notes: (1) The criteria for selection of the proxy group of ninety-one non-utility companies was that the non-utility companies be domestic and have a meaningful rate of return on net worth, common equity or partners' capital for each of the five years ended 2003 or projected 2007 - 2009 as reported in Value Line Investment Survey (Standard Edition). The proxy group of ninety-one non-utility companies was selected based upon the proxy group of six AUS Utility Reports water companies' unadjusted beta range of 0.17 - 0.77 and standard error of the regression range of 3.1496- 4.1060. These ranges are based upon plus or minus three standard deviations of the unadjusted beta and standard error of the regression as detailed in Ms. Ahern's direct testimony. Plus or minus three standard deviations captures 99.73% of the distribution of unadjusted betas and standard errors of the regression.
- (2) Ending 2003.
- (3) 2007-2009.
- (4) The Student's T-statistic associated with these returns exceeds 1.96 at the 95% level of confidence. Therefore, they have been excluded, as outliers, to arrive at proper mean historical and projected returns as fully explained in Ms. Ahern's testimony.
- (5) The standard deviation of group of six AUS Utility Reports water companies' standard error of the regression is 0.1594. The standard deviation of the standard error of the regression is calculated as follows:
- $$\text{Standard Deviation of the Std. Err. of the Regr.} = \frac{\text{Standard Error of the Regression}}{\sqrt{N}}$$
- where: N = number of observations. Since Value Line betas are derived from weekly price change observations over a period of five years, N = 259
- $$\text{Thus, } 0.1594 = \frac{3.6278}{\sqrt{518}} = \frac{3.6278}{22.7596}$$
- (6) Mid-point of the arithmetic mean of the historical five year average and five year projected rate of return on net worth.
- (7) Arithmetic mean of historical five year rates of return and five year projected rates of return on net worth, common equity or partners' capital excluding those 20% and above as well as those below 8.6%, i.e., 200 basis points above the prospective yield of 6.6% on A rated Moody's public utility bonds (from page 1 of Schedule PMA-10.)
- (8) Mid-point of the arithmetic mean of historical five year rates of return and five year projected rates of return on net worth, common equity or partners' capital excluding those 20% and above as well as those below 8.6%, i.e., 200 basis points above the prospective yield of 6.6% on A rated Moody's public utility bonds (from page 1 of Schedule PMA-10.)
- (9) The criteria for selection of the proxy group of ninety non-utility companies was that the non-utility companies be domestic and have a meaningful rate of return on net worth, common equity or partners' capital for each of the five years ended 2003 or projected 2007 - 2009 as reported in Value Line Investment Survey (Standard Edition). The proxy group of ninety non-utility companies was selected based upon the proxy group of three Value Line (Standard Edition) water companies' unadjusted beta range of 0.27 - 0.83 and standard error of the

Carolina Water Service, Inc.  
Comparable Earnings Analysis

regression range of 3.0390– 3.9618. These ranges are based upon plus or minus three standard deviations of the unadjusted beta and standard error of the regression as detailed in Ms. Ahern's direct testimony. Plus or minus three standard deviations captures 99.73% of the distribution of unadjusted betas and standard errors of the regression.

- (10) The standard deviation of the proxy group of three Value Line (Standard Edition) water companies' standard error of the regression is 0.1538 (3.5004 / 22.7596).

Source of Information: Value Line, Inc., March 15, 2005  
Value Line Investment Survey (Standard Edition)